PXM 2000 Series (PXM 2250/2260/2270) Multifunction Electricity Meter with Ethernet Communication

User & Installation Manual

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Product Model or Version Number:_____

Product Serial or License Number:_____

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Your Name:_____

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1 INTRODUCTION

About This Manual

This document is the user manual for the installation, operation, and maintenance of the Eaton Power Xpert® Meter 2000 Series. It is intended for authorized and qualified personnel who use the PXM 2250/2260/2270 meters. Please refer to the specific WARNINGS and CAUTIONS in this section before proceeding.
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Safety Precautions

All safety codes, safety standards, and/or regulations must be strictly observed in the installation, operation, and maintenance of this device.

WARNINGS refer to instructions that, if not followed, can result in death or injury.

CAUTIONS refer to instructions that, if not followed, can result in equipment damage.

WARNINGS

SHOCK HAZARDS:

IMPROPER INSTALLATION CAN CAUSE DEATH, INJURY, AND/OR EQUIPMENT DAMAGE. Follow all Warnings and Cautions. Completely read and understood the information in this document before attempting to install or operate the equipment. Improper wiring could cause death, injury, or equipment damage. Only qualified personnel are to service the PXM 2000 Series.

TROUBLESHOOTING PROCEDURES MAY REQUIRE PROXIMITY TO EXPOSED ENERGIZED (LIVE) ELECTRICAL WIRING AND/OR PARTS WHERE THE HAZARD OF FATAL ELECTRIC SHOCK IS PRESENT. Exercise extreme care to avoid injury or death. Always disconnect, lock-out, and tag the current and voltage sources and the control power supply circuit before touching the connections or components on the rear face of the meter base unit.

FAILURE TO GROUND THE PXM 2250/2260/2270 METER MAY RESULT IN INJURY, DEATH, OR EQUIPMENT DAMAGE. Properly ground the meter during installation.

Covered by one or more of the following patents:
US Patent Numbers D526920, D525893, 6751563, 6735535, 6636030.

2 OVERVIEW AND SPECIFICATIONS

Power Xpert Meter 2000 Series Overview

The PXM 2250/2260/2270 is a multifunction power and energy meter designed to be used in electrical substations, panel boards, and as a primary revenue meter, due to its high performance measurement capability. The unit provides multifunction measurement of all electrical parameters and makes the data available in multiple formats via display, communication systems, and through analog signal transmission.

Figure 2.1: PXM 2000 Meter

The PXM 2000 Series meter is designed with advanced meaurement capabilities, allowing it to achieve high performance accuracy. It is specified as a 0.2% class energy meter for billing applications as well as a highly accurate panel indication meter.

The PXM 2000 Series meter provides additional capabilities, including standard RS485, Ethernet capability, Modbus and DNP 3.0 Protocols, and Option cards that can be added at any time.

Features of the PXM 2000 Series include:

- 0.2% Class revenue certifiable energy and demand metering
- Meets ANSI C12.20 (0.2%) and IEC 687 (0.2%) classes
- Multifunction measurement including voltage, current, power, frequency, energy, power factor, etc.
- Power quality measurements (%THD and Alarm Limits)
- Percentage of Load Bar for analog meter reading
- Easy to use faceplate programming
- Standard RS485 communication
- Standard Ethernet communication
- Optional I/O Cards - field upgradeable without removing installed meter

In addition to the PXM 2000 Series meter with integral display/transducer configuration, a transducer-only (without a display) configuration is available. The PXM 2000 Series Transducer provides RS485 communication via Modbus RTU, Modbus ASCII or DNP 3.0 protocols, as well as standard Ethernet communication.

Voltage and Current Inputs

Universal Voltage Inputs

Voltage Inputs allow measurement up to 576VAC (Phase to Reference) and 721VAC (Phase to Phase). This insures proper meter safety when wiring directly to high voltage systems. One unit will perform to specification on 69 Volt, 120 Volt, 230 Volt, 277 Volt, and 347 Volt power systems.

NOTE: Higher voltages require the use of potential transformers (PTs).

Current Inputs

The unit supports a 5 amp or a 1 amp secondary for current measurements.
NOTE: The **s**econdary current must be specified and ordered with the meter.

The PXM 2000 Series Current Inputs use a unique dual input method:

Method 1: CT Pass Through

The CT passes directly through the meter without any physical termination on the meter. This insures that the meter cannot be a point of failure on the CT circuit. This is preferable for utility users when sharing relay class CTs. No Burden is added to the secondary CT circuit.

Method 2: Current "Gills"

This unit additionally provides ultra-rugged Termination Pass Through Bars that allow CT leads to be terminated on the meter. This eliminates any possible point of failure at the meter. This is a preferred technique for insuring that relay class CT integrity is not compromised (the CT will not open in a fault condition).

Ordering Information

PXM -2260 -M - A - 6 - 5 - 1 - 1 - 5

1 2 3 4 5 6 7

1. Model:
2250 = Power Meter
2260 = Power Quality Meter
2270 = Power Quality Plus Meter

2. Meter Type
M = Meter (with integral display)
T = Transducer Only (no display)

3. Frequency:
5 = 50 Hz System
6 = 60 Hz System

4. Current Input:
5 = 5 Amp Secondary
1 = 1 Amp Secondary

5. Power Supply:
1 = Universal, (90 - 265) VAC @50/60Hz or (100-370) VDC
4 = (18 - 60) VDC

6. I/O Slot 1: (See Chapter 7 for I/O Card Specifications.)
0 = None
1 = 2 Relay Outputs/2 Status Inputs
2 = 4 KYZ Pulses/4 Status Inputs
3 = 4 Analog Outputs - 0-1 mA
4 = 4 Analog Outputs - 4-20 mA

7. I/O 2: (See Chapter 7 for I/O Card Specifications.)
5 = Power Xpert® Ethernet Gateway Card

Example: PXM 2260-M-A-6-5-1-1-5
(PXM 2260 Meter with 60 Hz System, 5 Amp Secondary, 90-265 VAC/100-370 VDC Power Supply, 2 Relay Outputs/2 Status Inputs I/O Card in Card Slot 1 and standard Power Xpert® Ethernet Gateway Card in Card Slot 2)

Measured Values

The PXM 2000 Series provides the following Measured Values all in Real-Time Instantaneous, and some additionally as Average, Maximum and Minimum values.

PXM 2000 Series Measured Values

Measured Values	Instantaneous	Avg	Max	Min
Voltage L-N	X		X	X
Voltage L-L	X		X	X
Current per Phase	X	X	X	X
Current Neutral	X	X	X	X
WATT(A,B,C,Tot.)	X	X	X	X
VAR (A,B,C,Tot.)	X	X	X	X
VA (A,B,C,Tot.)	X	X	X	X
PF (A,B,C,Tot.)	X	X	X	X
+Watt-Hour (A,B,C,Tot.)	X			
-Watt-Hour (A,B,C,Tot.)	X			
Watt-Hour Net	X			
+VAR-Hour (A,B,C,Tot.)	X			
-VAR-Hour (A,B,C,Tot.)	X			
VAR-Hour Net (A,B,C,Tot.)	X			
VA-Hour (A,B,C,Tot.)	X			
Frequency	X		X	X
%THD	X		X	X
Voltage Angles	X			
Current Angles	X			
% of Load Bar	X			

Utility Peak Demand

The PXM 2000 Series provides user-configured Fixed Window or Sliding Window Demand modes. This feature enables you to set up a customized Demand profile. Fixed Window Demand mode records the average demand for time intervals that you define (usually 5, 15 or 30 minutes). Sliding Window Demand mode functions like multiple, overlapping Fixed Window Demands. You define the subintervals at which an average of demand is calculated. An example of Sliding Window Demand mode would be a 15-minute Demand block using 5-minute subintervals, thus providing a new demand reading every 5 minutes, based on the last 15 minutes.

Utility Demand Features can be used to calculate Watt, VAR, VA and PF readings. Voltage provides an Instantaneous Max and Min reading which displays the highest surge and lowest sag seen by the meter. All other parameters offer Max and Min capability averaged over the demand period (meter) or true Min and Max (Gateway Card)..

Specifications

Power Supply

Range:	1 Option: Universal, (90 - 265)VAC @50/60 Hz or (100-370)VDC 4 Option: (18 - 60)VDC
Power Consumption:	(5 to 10)VA, (3.5 to 7)W - depending on the meter's hardware configuration

Voltage Inputs (Measurement Category III) (See Accuracy Specifications, later in this chapter.

Range:	Universal, Auto-ranging: Phase to Reference (Va, Vb, Vc to Vref): (20 to 576)VAC Phase to Phase (Va to Vb, Vb to Vc, Vc to Va): (0 to 721)VAC
Supported hookups:	3 Element Wye, 2.5 Element Wye, 2 Element Delta, 4 Wire Delta
Input Impedance:	1M Ohm/Phase
Burden:	0.36VA/Phase Max at 600 Volts; 0.014VA at 120 Volts
Pickup Voltage:	20VAC
Connection:	7 Pin 0.400" Pluggable Terminal Block AWG#12 -26/ (0.129 -3.31) mm^2
Fault Withstand:	Meets IEEE C37.90.1
Reading:	Programmable Full Scale to any PT Ratio

Current Inputs(See Accuracy Specifications, later in this chapter.)

Class 10:	5A Nominal, 10A Maximum
Class 2:	1A Nominal, 2A Maximum
Burden:	0.005VA Per Phase Max at 11 Amps
Pickup Current:	0.1% of nominal
Connections:	O Lug or U Lug Electrical Connection (Diagram 4.1) Pass-through Wire, 0.177" / 4.5mm Maximum Diameter (Diagram 4.2) Quick Connect, 0.25" Male Tab (Diagram 4.3)
Fault Withstand:	100A/10sec., 300A/3sec., 500A/1sec.

KYZ/RS485 Port Specifications

RS485 Transceiver; meets or exceeds EIA/TIA-485 Standard:

Type:	Two-wire, half duplex
Min. Input Impedance:	96kΩ
Max. Output Current:	±60mA

Wh Pulse

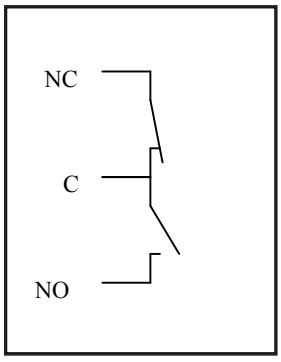
KYZ output contacts (and infrared LED light pulses through face plate):
(See Chapter 6 for Kh values.)

Pulse Width:	90ms
Full Scale Frequency:	~3Hz
Contact type:	Solid State – SPDT (NO – C – NC)
Relay type:	Solid state
Peak switching voltage:	DC ±350V
Continuous load current:	120mA
Peak load current:	350mA for 10ms
On resistance, max.:	35Ω
Leakage current:	1µA@350V
Isolation:	AC 3750V
Reset State:	(NC - C) Closed; (NO - C) Open

Infrared LED:

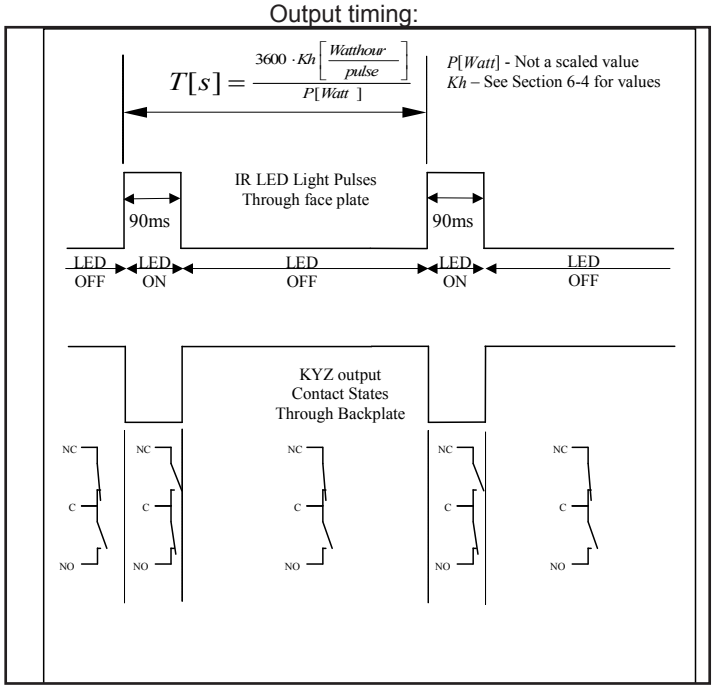
Peak Spectral Wavelength:	940nm
Reset State:	Off

Internal Schematic:



(De-energized State)

Output timing:



Isolation

All Inputs and Outputs are galvanically isolated to 2500 Vac

Environmental Rating

Storage:	$(-20 \text{ to } +70)^0$ C
Operating:	$(-20 \text{ to } +70)^0$ C
Humidity:	to 95% RH Non-condensing
Faceplate Rating:	NEMA12 (Water Resistant), Mounting Gasket Included

Measurement Methods

Voltage, Current:	True RMS
Power:	Sampling at over 400 Samples per Cycle on All Channels

Update Rate

Watts, VAR and VA:	Every 6 cycles (e.g., 100 ms @ 60 Hz)
All other parameters:	Every 60 cycles (e.g., 1 s @ 60 Hz) 1 second for current only measurement, if reference voltage is not available

Communication

Serial Communications Format:
1. RS485 Port through Back Plate
2. Energy Pulse Output through Back Plate

Protocols:	Modbus RTU, Modbus ASCII, DNP 3.0
Com Port Baud Rate:	9,600 to 57,600 bps
Com Port Address:	001-247
Data Format:	8 Bit, No Parity
PXM 2000 Series Transducer	Default Initial Communication Baud 9600 (See Chapter 5)

Network Communications Format:

Connection Type:	RJ45, 10/100BaseT Ethernet Network Port
Protocols:	Ethernet TCP/IP, Modbus TCP, HTTP, HTTPS, NTP, SMTP, SNMP

Mechanical Parameters

Dimensions: see Chapter 3.

Weight:	2 pounds/ 0.9kg (ships in a 6”/152.4mm cube container) (Without Option Card)

Compliance

- UL Listing: USL/CNL E185559
- CE (EN61326-1, FCC Part 15, Subpart B, Class A)
- IEC 687 (0.2% Accuracy)
- ANSI C12.20 (0.2% Accuracy)
- ANSI C62.41 (Burst)
- IEC 1000-4-2 - ESD

Accuracy (See full Range specifications earlier in this chapter.)

For 23º C, 3 Phase balanced Wye or Delta load, at 50 or 60 Hz (as per order), 5A (Class 10) nominal unit:

Parameter	Accuracy	Accuracy Input Range[1]
Voltage L-N [V]	0.1% of reading	(69 to 480)V
Voltage L-L [V]	0.2% of reading [2]	(120 to 600)V
Current Phase [A]	0.1% of reading[3]	(0.15 to 5) A
Current Neutral (calculated) [A]	2% of Full Scale	(0.15 to 5) A @ (45 to 65) Hz
Active Power Total [W]	0.2% of reading [1, 2]	(0.15 to 5) A @ (69 to 480) V @ +/- (0.5 to 1) lag/lead PF
Active Energy Total [Wh]	0.2% of reading [1, 2]	(0.15 to 5) A @ (69 to 480) V @ +/- (0.5 to 1) lag/lead PF
Reactive Power Total [VAR]	0.2% of reading [1, 2]	(0.15 to 5) A @ (69 to 480) V @ +/- (0 to 0.8) lag/lead PF
Reactive Energy Total [VARh]	0.2% of reading [1, 2]	(0.15 to 5) A @ (69 to 480) V @ +/- (0 to 0.8) lag/lead PF
Apparent Power Total [VA]	0.2% of reading [1, 2]	(0.15 to 5) A @ (69 to 480) V @ +/- (0.5 to 1) lag/lead PF
Apparent Energy Total [VAh]	0.2% of reading [1, 2]	(0.15 to 5) A @ (69 to 480) V @ +/- (0.5 to 1) lag/lead PF
Power Factor	0.2% of reading [1, 2]	(0.15 to 5) A @ (69 to 480) V @ +/- (0.5 to 1) lag/lead PF
Frequency [Hz]	+/- 0.03 Hz	(45 to 65) Hz
Total Harmonic Distortion [%]	+/- 2%	(0.5 to 10)A[4] or (69 to 480)V, measurement range (1 to 99.99)%
Load Bar	+/- 1 segment	(0.005 to 6) A

1 • For 2.5 element programmed units, degrade accuracy by an additional 0.5% of reading.
• For 1A (Class 2) Nominal, degrade accuracy by an additional 0.5% of reading.
• For 1A (Class 2) Nominal, the input current range for accuracy specification is 20% of the values listed in the table.

2 For unbalanced voltage inputs where at least one crosses the 150V autoscale threshold (for example, 120V/120V/208V system), degrade the accuracy to 0.4% of reading.

3 With reference voltage applied (VA, VB, or VC). Otherwise, degrade accuracy to 0.2%. See hookup diagrams 8, 9, and 10 in Chapter 4.

4 At least one voltage input (minimum 20 Vac) must be connected for THD measurement on current channels.

3 MECHANICAL INSTALLATION

Introduction

The PXM 2000 Series can be installed using a standard ANSI C39.1 (4” Round) or an IEC 92mm DIN (Square) form. In new installations, simply use DIN or ANSI punches. For existing panels, pull out old analog meters and replace them with the PXM Series meter. The various models use the same installation. See Chapter 4 for wiring diagrams.

NOTE: The drawings shown below and on the next page give you the meter dimensions in inches and millimeters (mm shown in brackets). Tolerance is +/- 0.1” [2.54 mm].

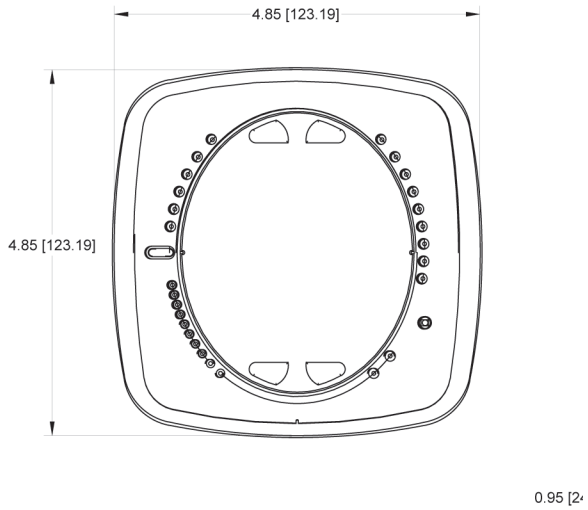


Figure 3.1: Meter Face

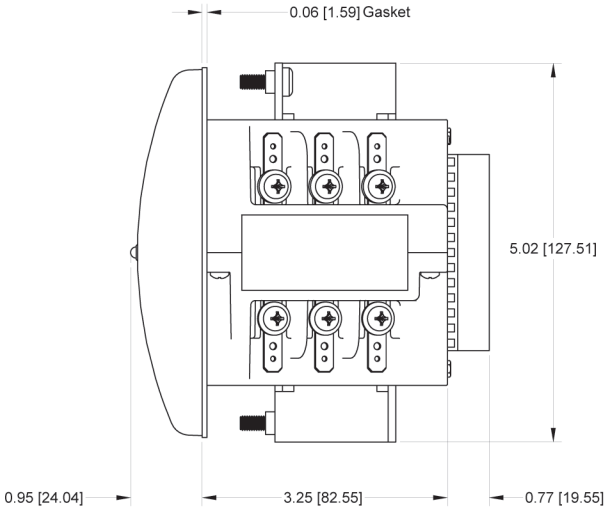


Figure 3.2: Meter Dimensions

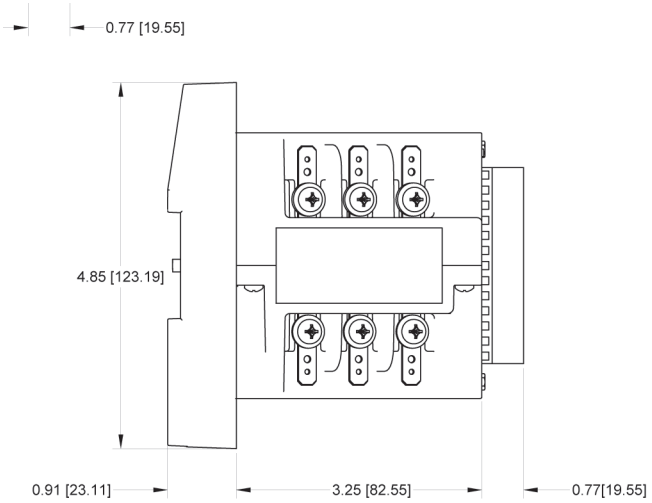


Figure 3.3: Transducer Dimensions

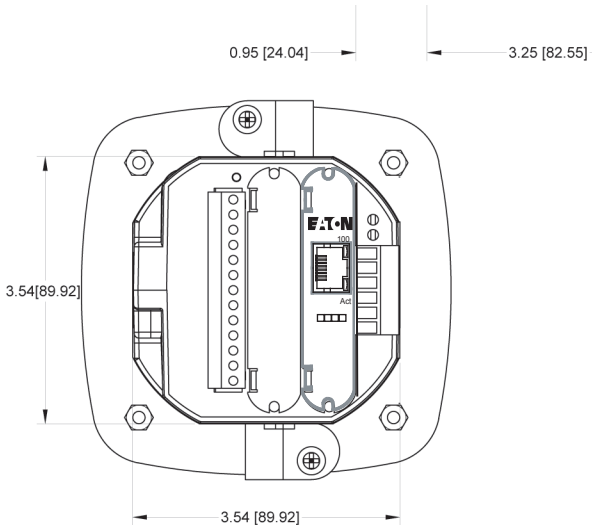


Fig. 3.4: Meter Back

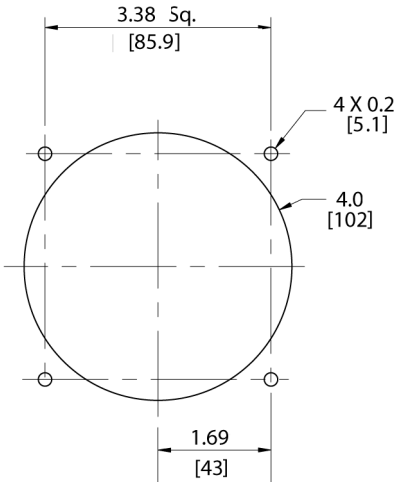


Figure 3.5: ANSI Mounting Panel Cutout

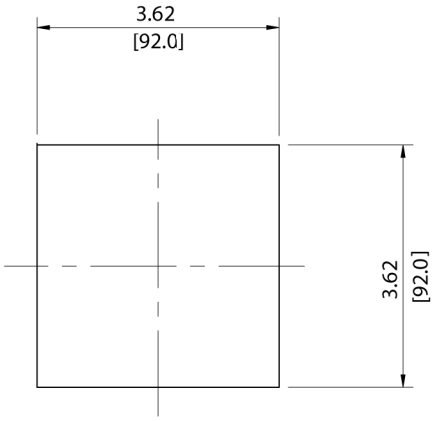


Figure 3.6: DIN Mounting Cutout

ANSI Installation Steps

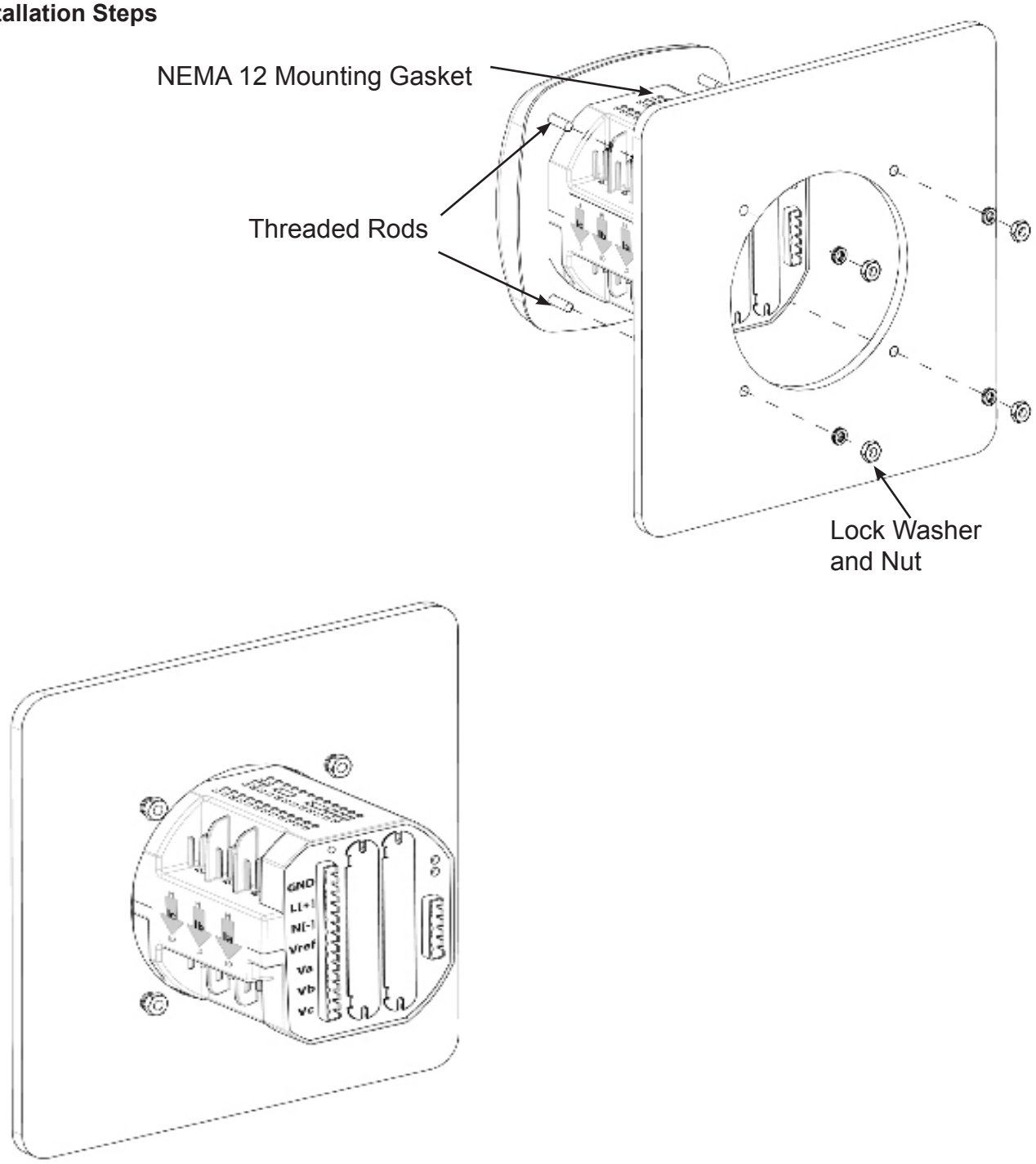


Figure 3.7: ANSI Mounting Procedure

1. Insert 4 threaded rods by hand into the back of meter. Twist until secure.
2. Slide NEMA 12 Mounting Gasket onto back of meter with rods in place.
3. Slide meter with Mounting Gasket into panel.
4. Secure from back of panel with lock washer and nut on each threaded rod. Use a small wrench to tighten. Do not overtighten. The maximum installation torque is 0.4 Newton-Meter.

DIN Installation Steps

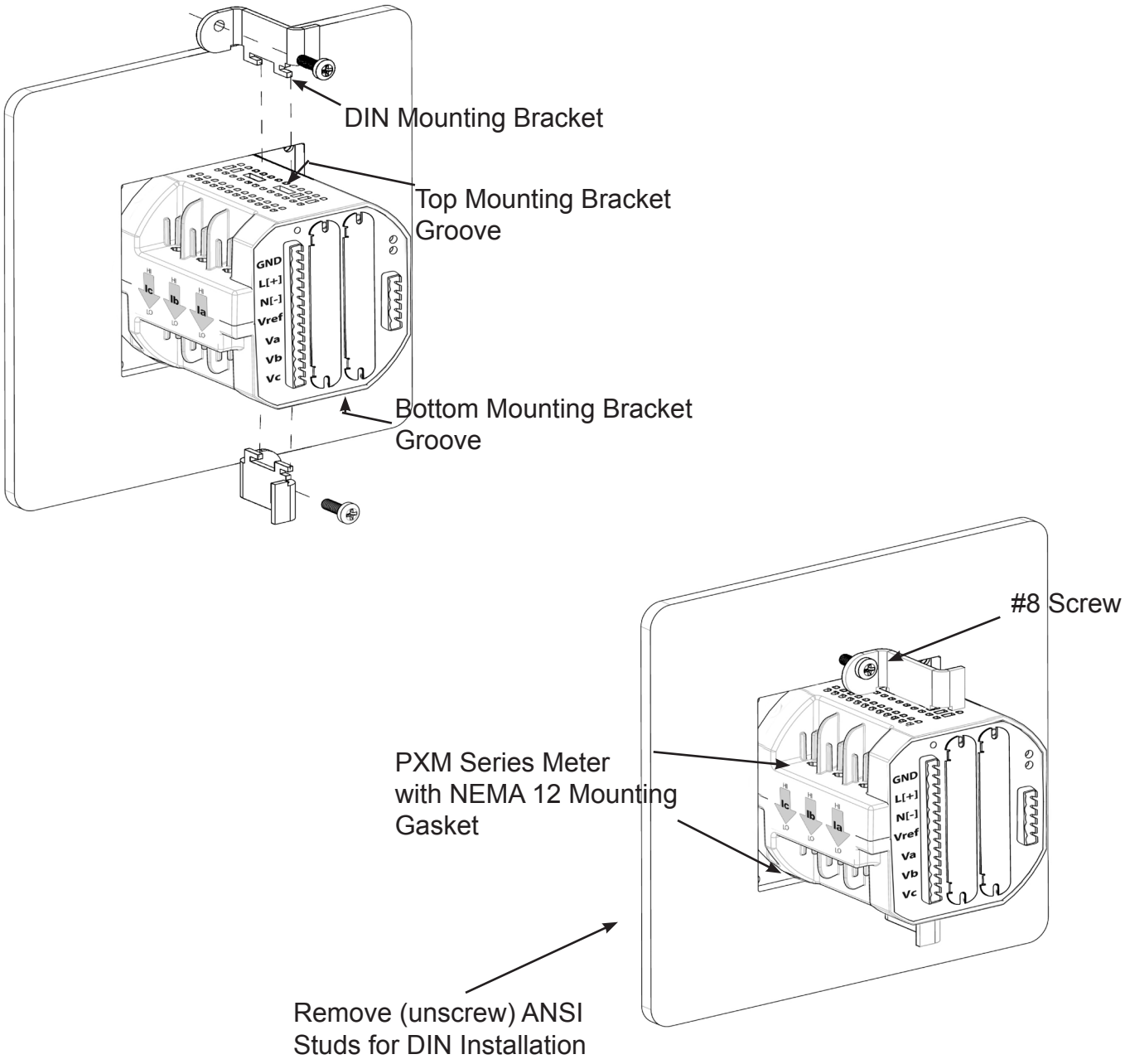


Figure 3.8: DIN Mounting Procedure

1. Slide meter with NEMA 12 Mounting Gasket into panel. (Remove ANSI Studs, if in place.)
2. From back of panel, slide 2 DIN Mounting Brackets into grooves in top and bottom of meter housing. Snap into place.
3. Secure meter to panel with lock washer and a #8 screw through each of the 2 mounting brackets. Tighten with a #2 Phillips screwdriver. Do not overtighten. The maximum installation torque is 0.4 Newton-Meter.

PXM 2000 Series Transducer Installation

The PXM 2000 Series Transducer model is installed using DIN Rail Mounting.

Specs for DIN Rail Mounting:	International Standards DIN 46277/3
DIN Rail (Slotted) Dimensions:	0.297244” x 1.377953” x 3” (inches)
	7.55mm x 35mm x 76.2mm (millimeters)

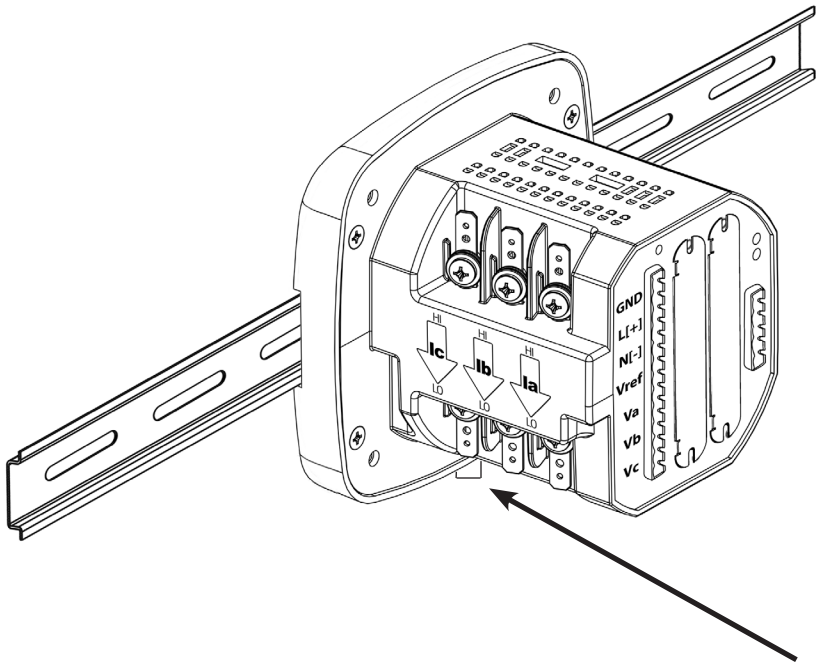


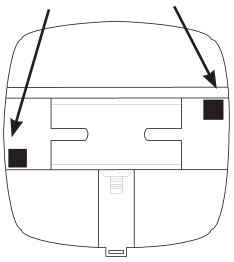
Figure 3.9: DIN Rail Mounting Procedure

1. Slide top groove of meter onto the DIN Rail.
2. Press gently until the meter clicks into place.

NOTES:

- To remove the meter from the DIN Rail, pull down on the Release Clip to detach the unit from the rail.
- If mounting with the DIN Rail provided, use the Black Rubber Stoppers (also provided). See figure on the right.

Release Clip



NOTE ON DIN RAILS:
DIN Rails are commonly used as a mounting channel for most terminal blocks, control devices, circuit protection devices and PLCs. DIN Rails are made of cold rolled steel electrolitically plated and are also available in aluminum, PVC, stainless steel and copper.

4 ELECTRICAL INSTALLATION

Considerations When Installing Meters

Installation of the PXM 2000 Series must be performed **only by** qualified personnel who follow standard safety precautions during all procedures. Those personnel should have appropriate training and experience with high voltage devices. Appropriate safety gloves, safety glasses and protective clothing is recommended.

During normal operation of the PXM 2000 Series, dangerous voltages flow through many parts of the meter, including: Terminals and any connected CTs (Current Transformers) and PTs (Potential Transformers), all I/O Modules (Inputs and Outputs) and their circuits. All Primary and Secondary circuits can, at times, produce lethal voltages and currents. Avoid contact with any current-carrying surfaces.

Do not use the meter or any I/O Output Device for primary protection or in an energy-limiting capacity. The meter can only be used as secondary protection. Do not use the meter for applications where failure of the meter may cause harm or death. Do not use the meter for any application where there may be a risk of fire.

All meter terminals should be inaccessible after installation.

Do not apply more than the maximum voltage the meter or any attached device can withstand. Refer to meter and/or device labels and to the Specifications for all devices before applying voltages. Do not HIPOT/Dielectric test any Outputs, Inputs or Communications terminals.

Eaton recommends the use of Shorting Blocks and Fuses for voltage leads and power supply to prevent hazardous voltage conditions or damage to CTs, if the meter needs to be removed from service. CT grounding is optional.

NOTES:

- IF THE EQUIPMENT IS USED IN A MANNER NOT SPECIFIED BY THE MANUFACTURER, THE PROTECTION PROVIDED BY THE EQUIPMENT MAY BE IMPAIRED.
- THERE IS NO REQUIRED PREVENTIVE MAINTENANCE OR INSPECTION NECESSARY FOR SAFETY. HOWEVER, ANY REPAIR OR MAINTENANCE SHOULD BE PERFORMED BY THE FACTORY.

DISCONNECT DEVICE: The following part is considered the equipment disconnect device. A SWITCH OR CIRCUIT-BREAKER SHALL BE INCLUDED IN THE END-USE EQUIPMENT OR BUILDING INSTALLATION. THE SWITCH SHALL BE IN CLOSE PROXIMITY TO THE EQUIPMENT AND WITHIN EASY REACH OF THE OPERATOR. THE SWITCH SHALL BE MARKED AS THE DISCONNECTING DEVICE FOR THE EQUIPMENT.

CT Leads Terminated to Meter

The PXM 2000 Series is designed to have Current Inputs wired in one of three ways. Diagram 4.1 shows the most typical connection where CT Leads are terminated to the meter at the Current Gills. This connection uses Nickel-Plated Brass Studs (Current Gills) with screws at each end. This connection allows the CT wires to be terminated using either an “O” or a “U” lug. Tighten the screws with a #2 Phillips screwdriver. The maximum installation torque is 1 Newton-Meter.

Other current connections are shown in Figures 4.2 and 4.3. Voltage and RS485/KYZ Connection is shown in Figure 4.4.

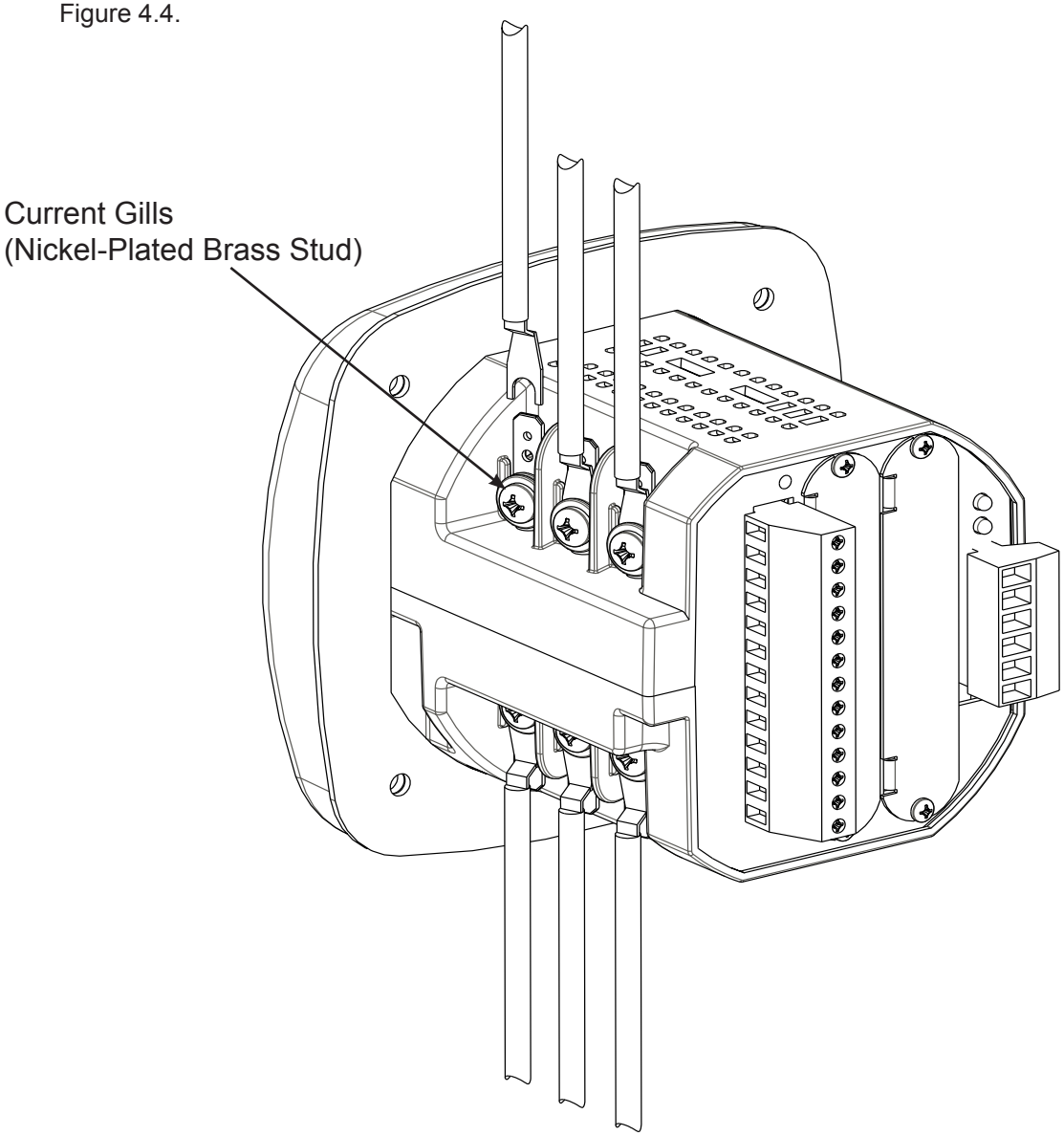


Figure 4.1: CT Leads terminated to Meter, #8 Screw for Lug Connection

Wiring Diagrams are shown later in this chapter.

Communications Connections are detailed in Chapter 5.

CT Leads Pass Through (No Meter Termination)

The second method allows the CT wires to pass through the CT Inputs without terminating at the meter. In this case, remove the Current Gills and place the CT wire directly through the CT opening. The opening will accomodate up to 0.177” / 4.5mm maximum diameter CT wire.

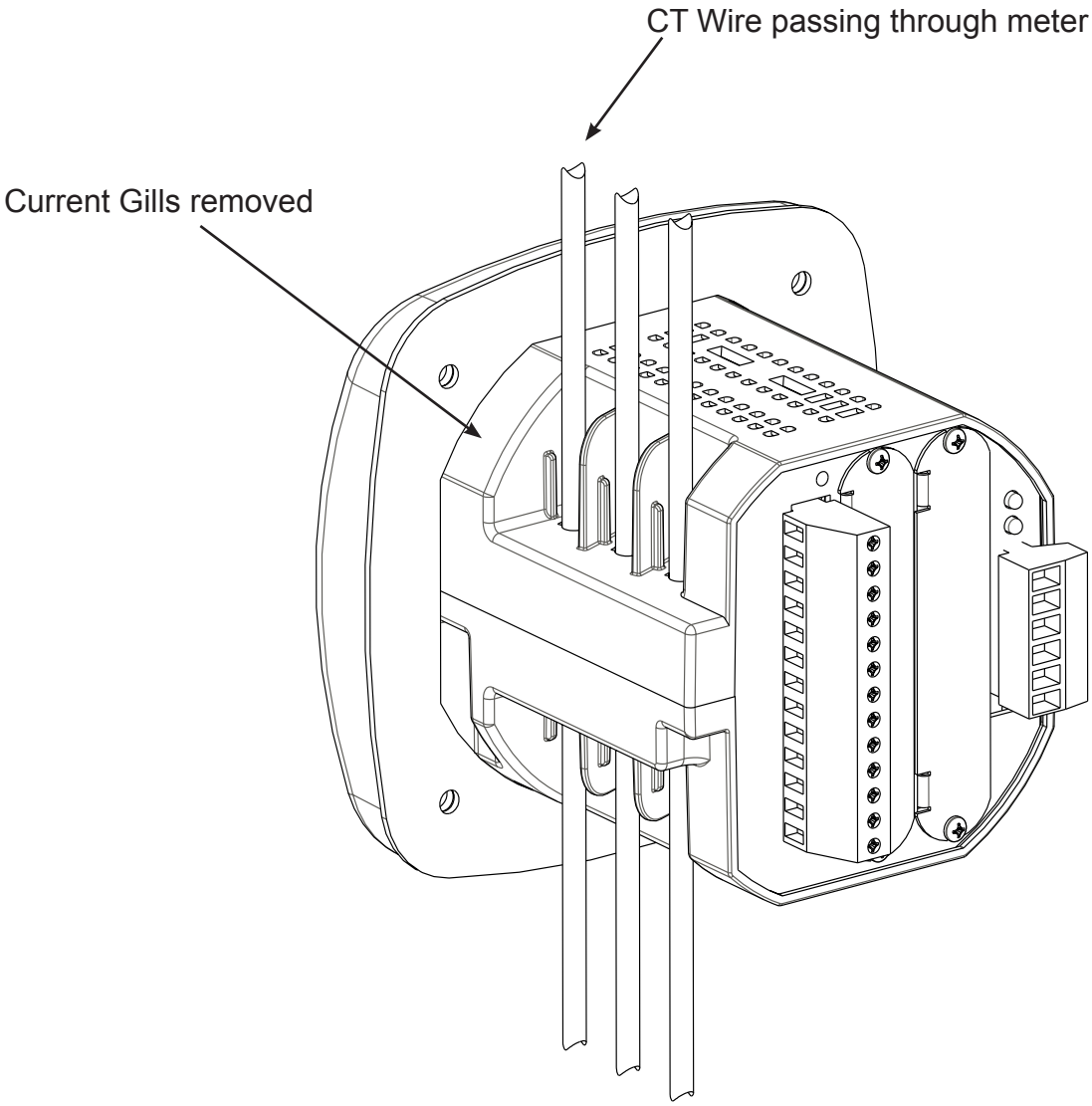


Figure 4.2: Pass-Through Wire Electrical Connection

Quick Connect Crimp-on Terminations

For Quick Termination or for Portable Applications, a 0.25” Quick Connect Crimp-on Connectors can also be used.

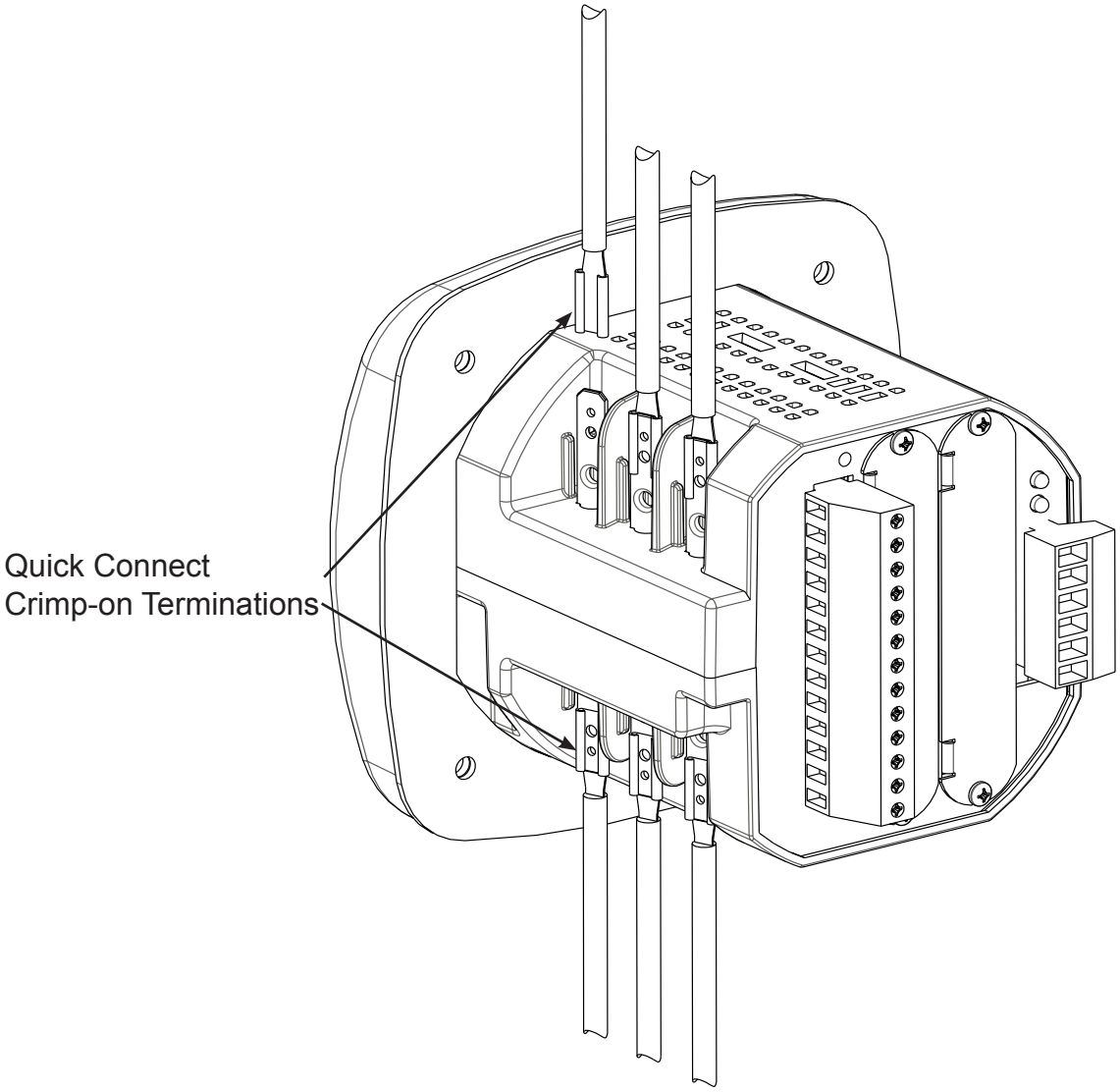


Figure 4.3: Quick Connect Electrical Connection

Voltage and Power Supply Connections

Voltage Inputs are connected to the back of the unit via a optional wire connectors. The connectors accomodate AWG# 12 -26/ (0.129 - 3.31)mm^2.

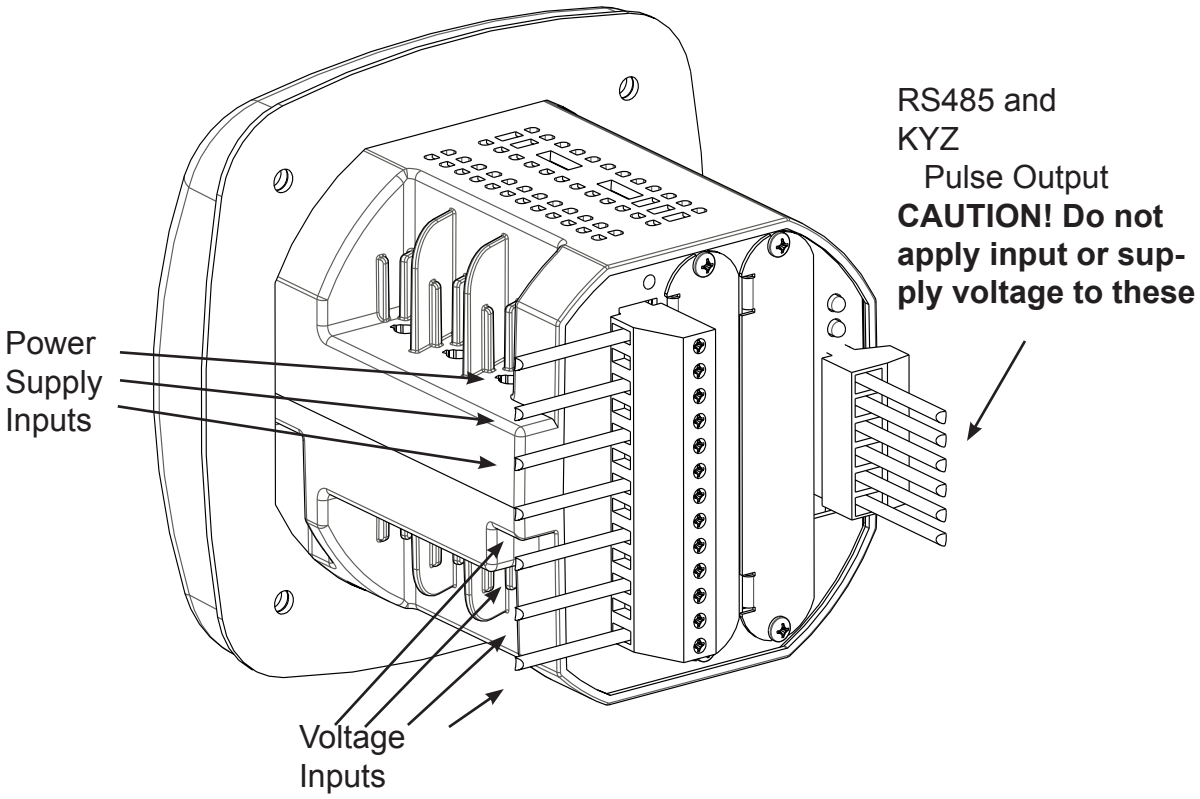


Figure 4.4: Voltage Connection

Ground Connections

The meter's Ground Terminals should be connected directly to the installation's protective earth ground. Use AWG# 12/2.5 mm^2 wire for this connection.

Voltage Fuses

Eaton recommends the use of fuses on each of the sense voltages and on the control power, even though the wiring diagrams in this chapter do not show them.

Use a 0.1 Amp fuse on each voltage input.
Use a 3 Amp Slow Blow fuse on the power supply.

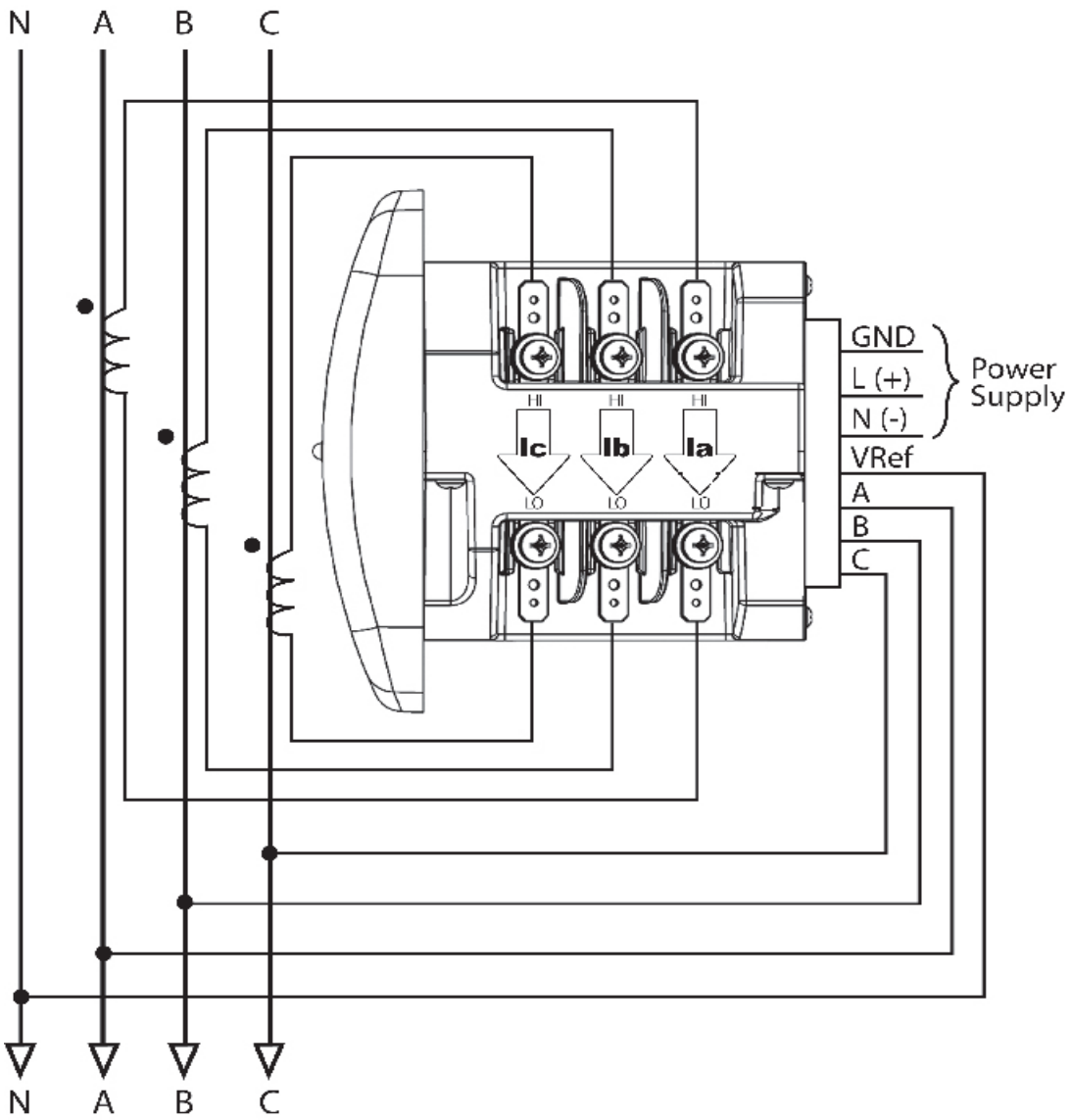
Electrical Connection Diagrams

The following pages contain electrical connection diagrams for the PXM 2000 Series. Choose the diagram that best suits your application. Be sure to maintain the CT polarity when wiring.

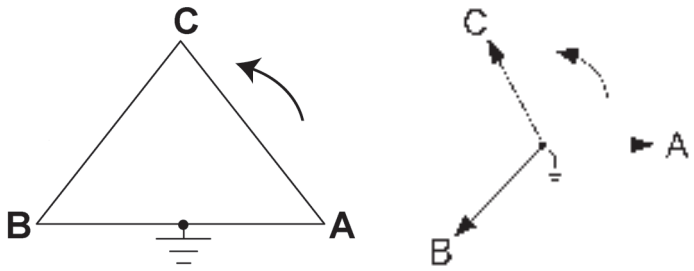
The diagrams are presented in the following order:

1. Three Phase, Four-Wire System Wye/Delta with Direct Voltage, 3 Element
   a. Example of Dual Phase Hookup
   b. Example of Single Phase Hookup
2. Three Phase, Four-Wire System Wye with Direct Voltage, 2.5 Element
3 Three-Phase, Four-Wire Wye/Delta with PTs, 3 Element
4. Three-Phase, Four-Wire Wye with PTs, 2.5 Element
5. Three-Phase, Three-Wire Delta with Direct Voltage
6. Three-Phase, Three-Wire Delta with 2 PTs
7. Three-Phase, Three-Wire Delta with 3 PTs
8. Current Only Measurement (Three Phase)
9. Current Only Measurement (Dual Phase)
10. Current Only Measurement (Single Phase)

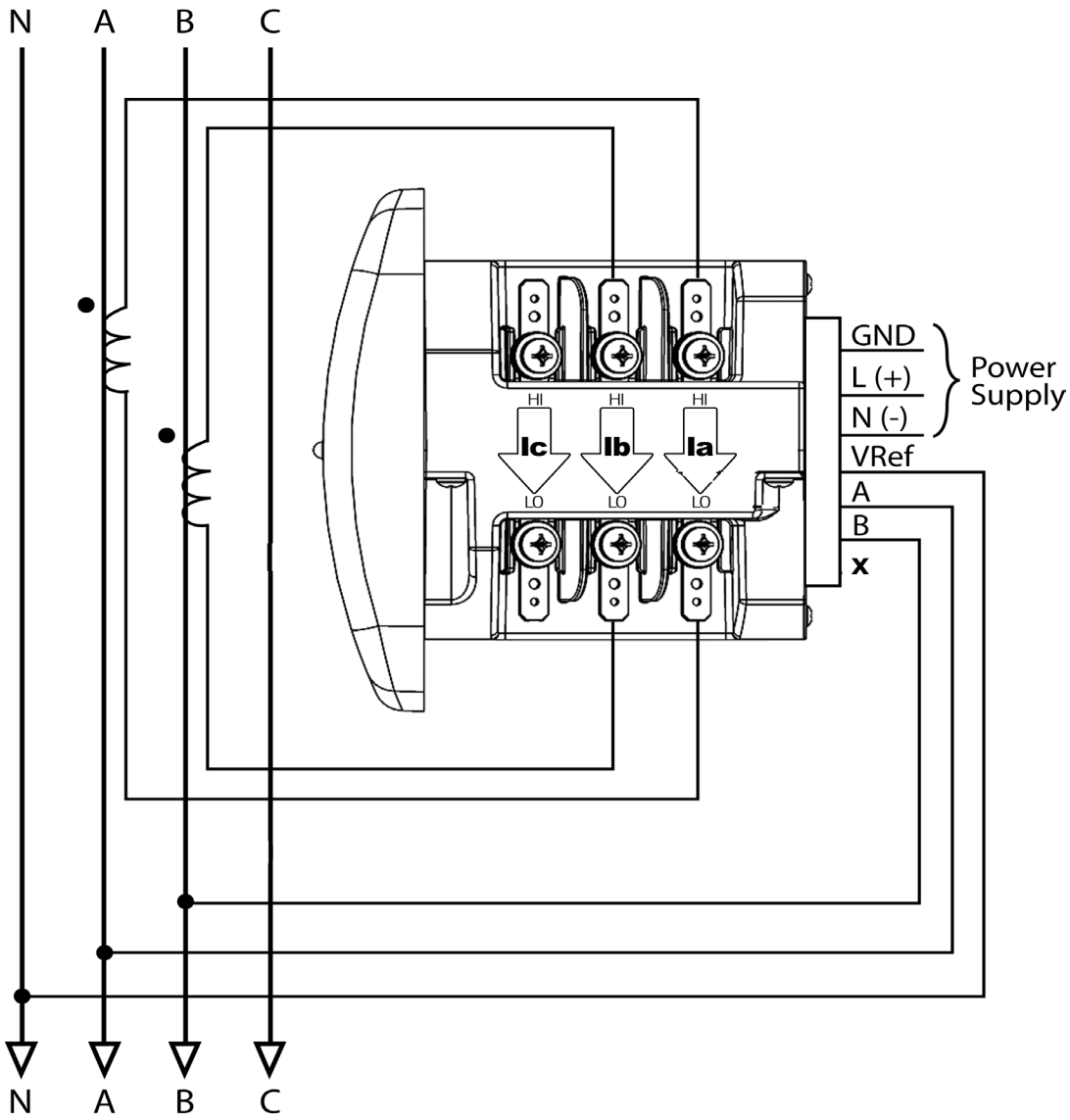
1. Service: WYE/Delta, 4-Wire with No PTs, 3 CTs

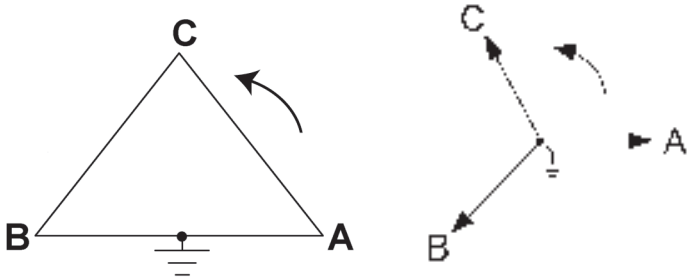


Select: "3 EL WYE" (3 Element Wye) from the Meter's Front Panel Display. (See Chapter 6.)



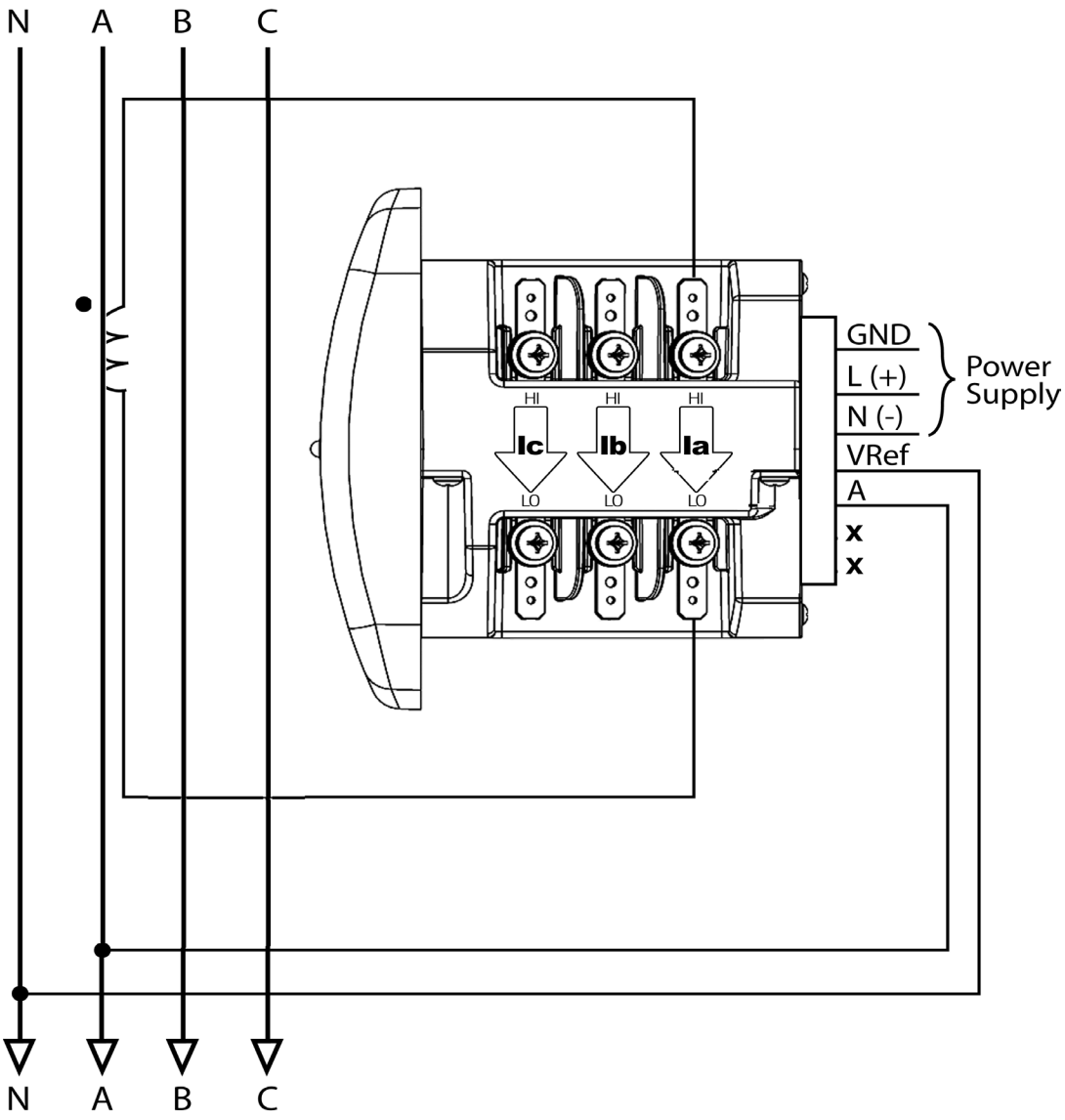
1a. Example of Dual Phase Hookup



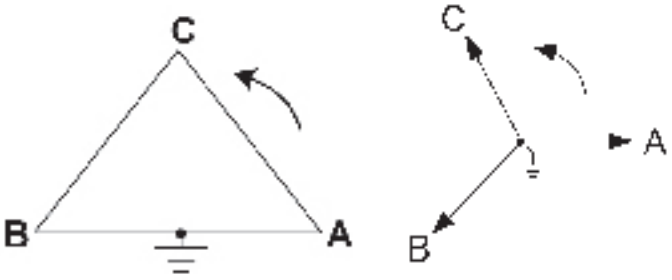


Select: "3 EL WYE" (3 Element Wye) from the Meter's Front Panel Display. (See Chapter 6.)

1b. Example of Single Phase Hookup

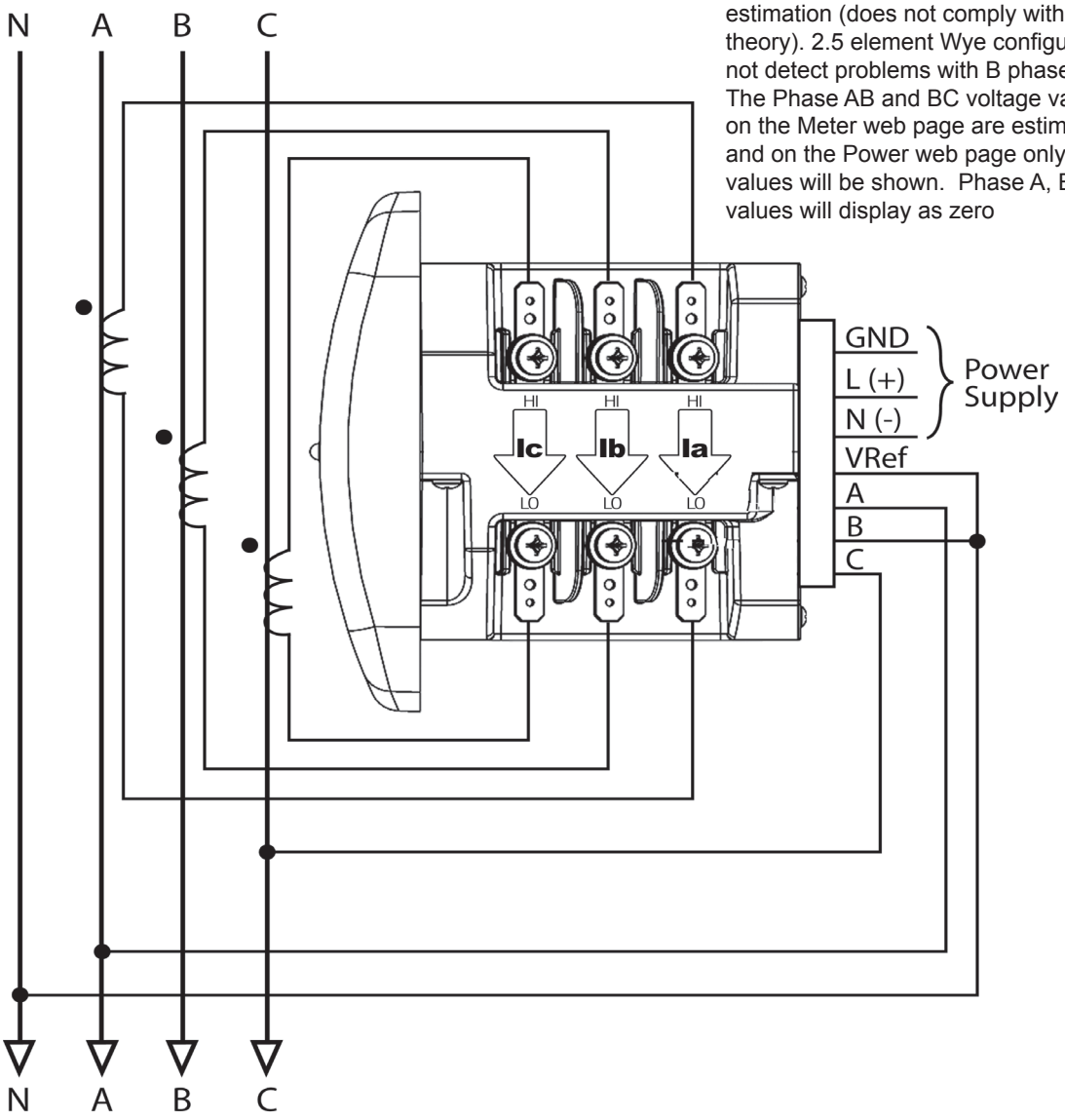


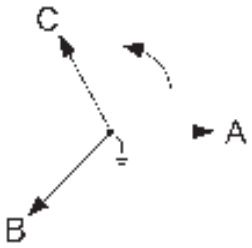
Select: " 3 EL WYE " (3 Element Wye) from the Meter's Front Panel Display. (See Chapter 6.)



2. Service: 2.5 Element WYE, 4-Wire with No PTs, 3 CTs

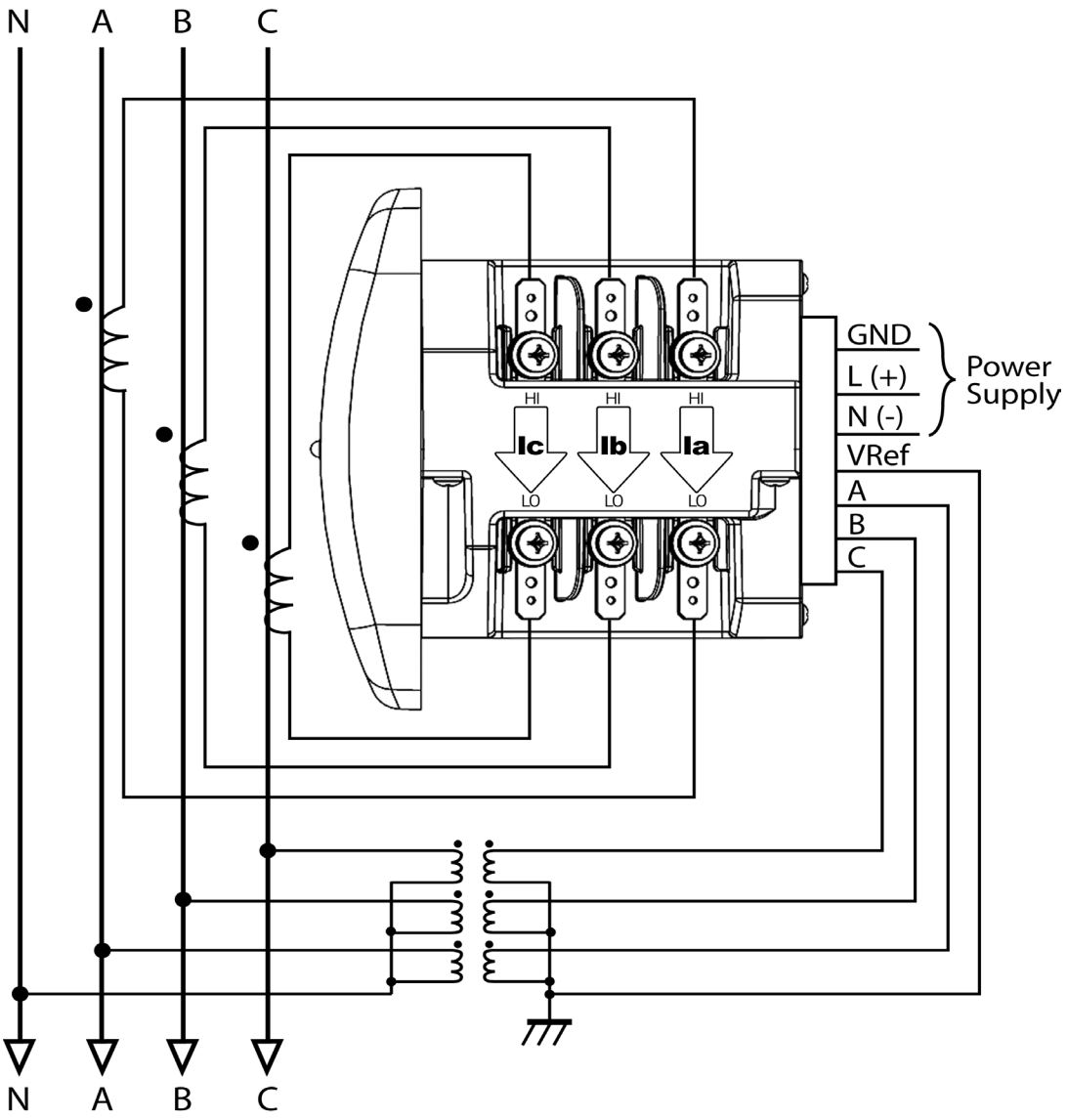
This configuration is **not** recommended. In this configuration the B phase voltage is not measured to save the cost of a B Phase voltage transformer. A balanced 3 phase voltage is assumed to estimate B phase voltage for the purpose of 3 phase power and energy estimation (does not comply with Blondel's theory). 2.5 element Wye configuration cannot detect problems with B phase voltage. The Phase AB and BC voltage values shown on the Meter web page are estimates only, and on the Power web page only the System values will be shown. Phase A, B, and C values will display as zero

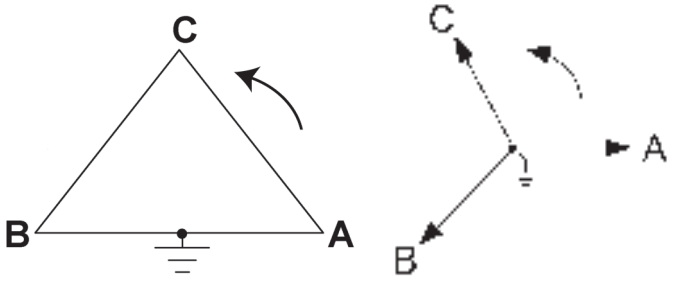




Select: " 2.5 EL WYE " (2.5 Element Wye) from the Meter's Front Panel Display. (See Chapter 6.)

3. Service: WYE/Delta, 4-Wire with 3 PTs, 3 CTs

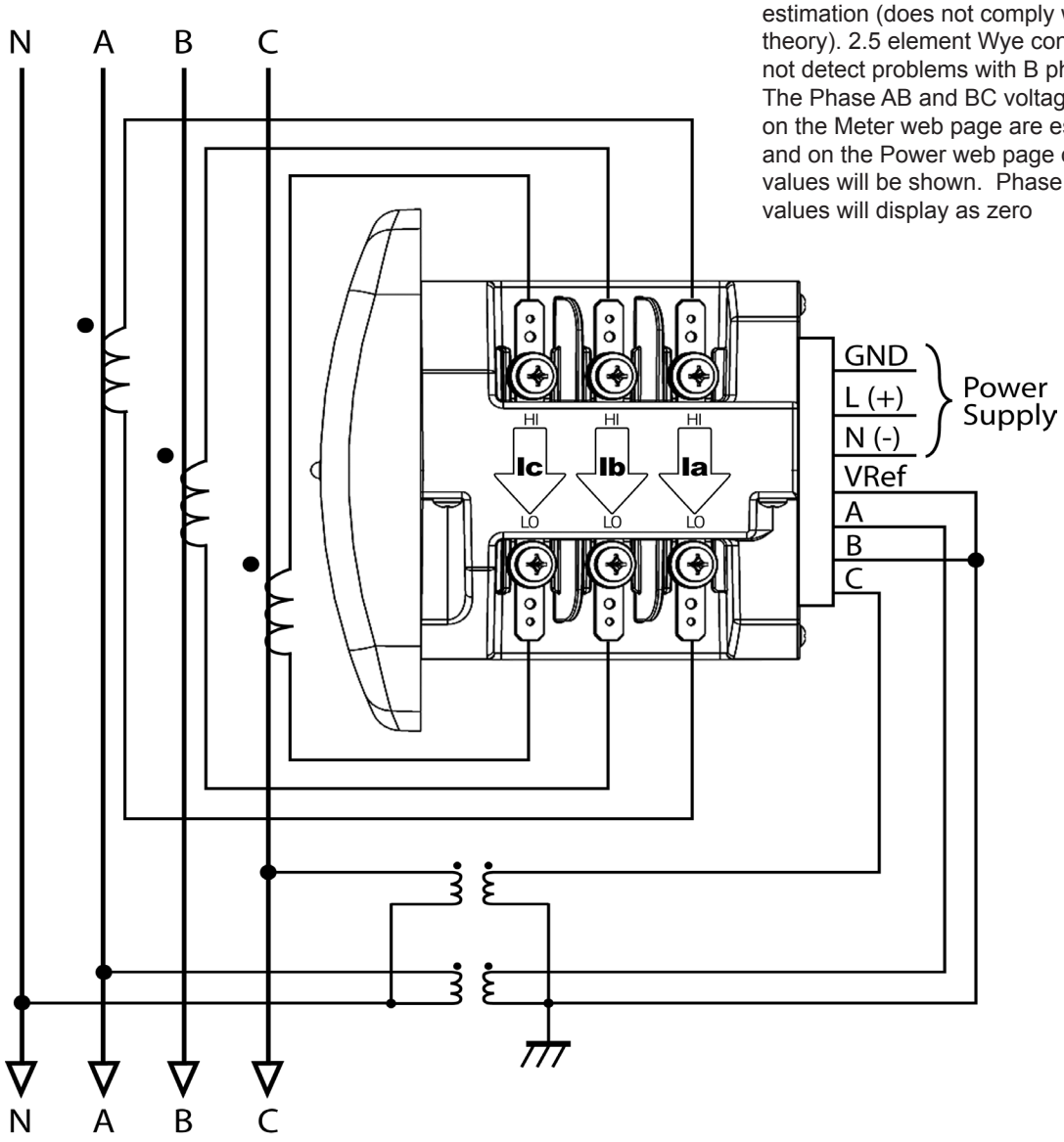




Select: " 3 EL WYE " (3 Element Wye) from the Meter's Front Panel Display. (See Chapter 6.)

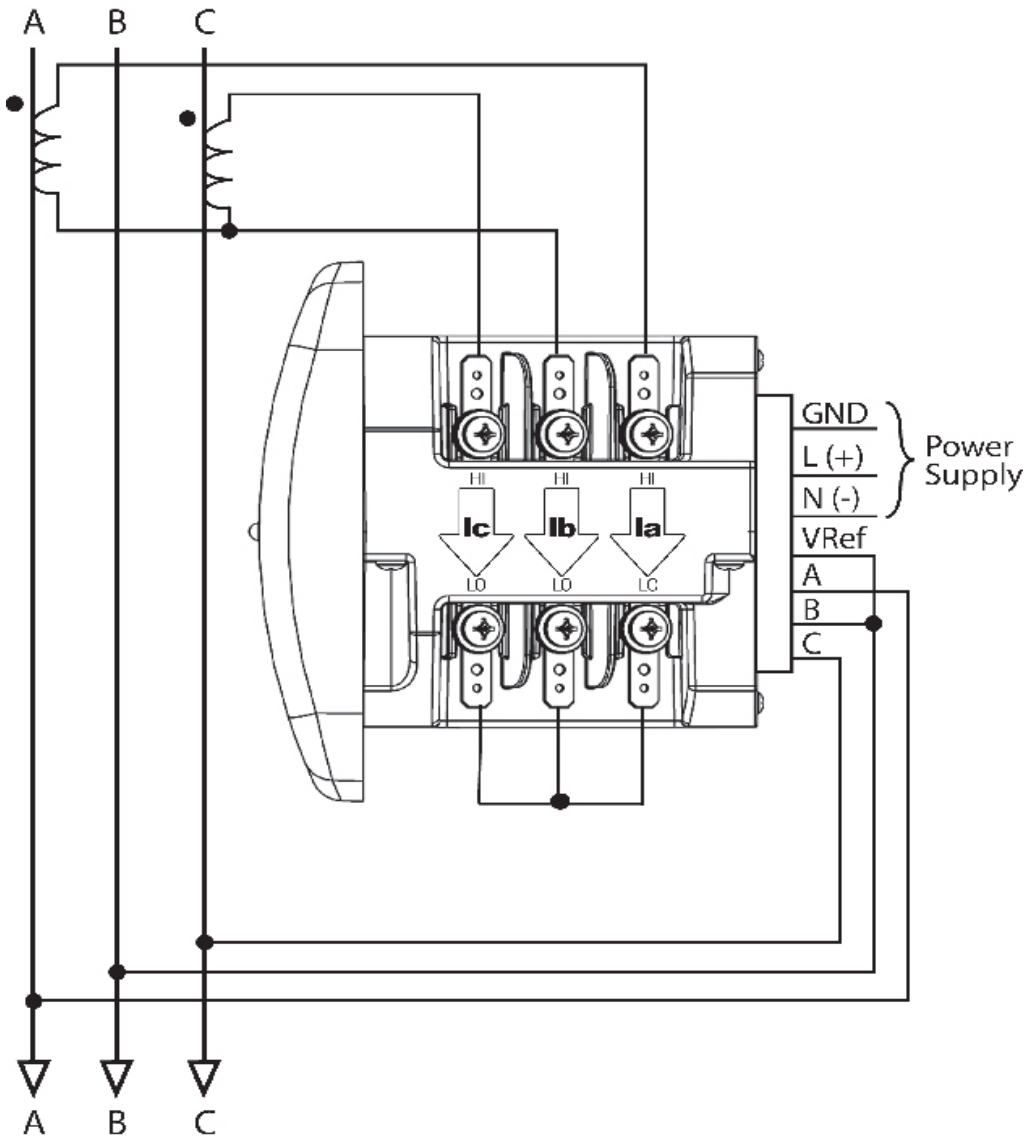
4. Service: 2.5 Element WYE, 4-Wire with 2 PTs, 3 CTs

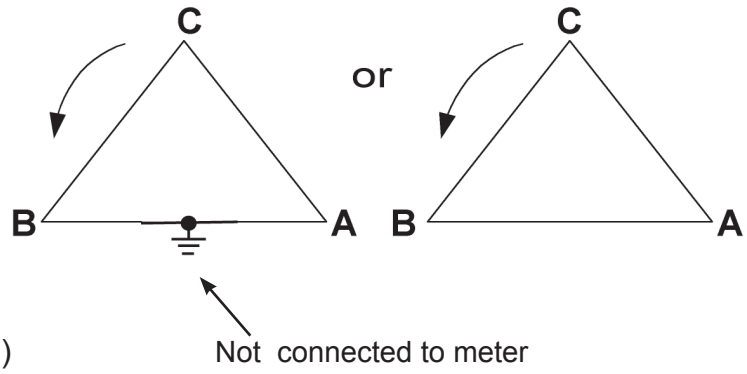
This configuration is **not** recommended. In this configuration the B phase voltage is not measured to save the cost of a B Phase voltage transformer. A balanced 3 phase voltage is assumed to estimate B phase voltage for the purpose of 3 phase power and energy estimation (does not comply with Blondel's theory). 2.5 element Wye configuration cannot detect problems with B phase voltage. The Phase AB and BC voltage values shown on the Meter web page are estimates only, and on the Power web page only the System values will be shown. Phase A, B, and C values will display as zero



Select: " 2.5 EL WYE " (2.5 Element Wye) from the Meter's Front Panel Display. (See Chapter 6.)

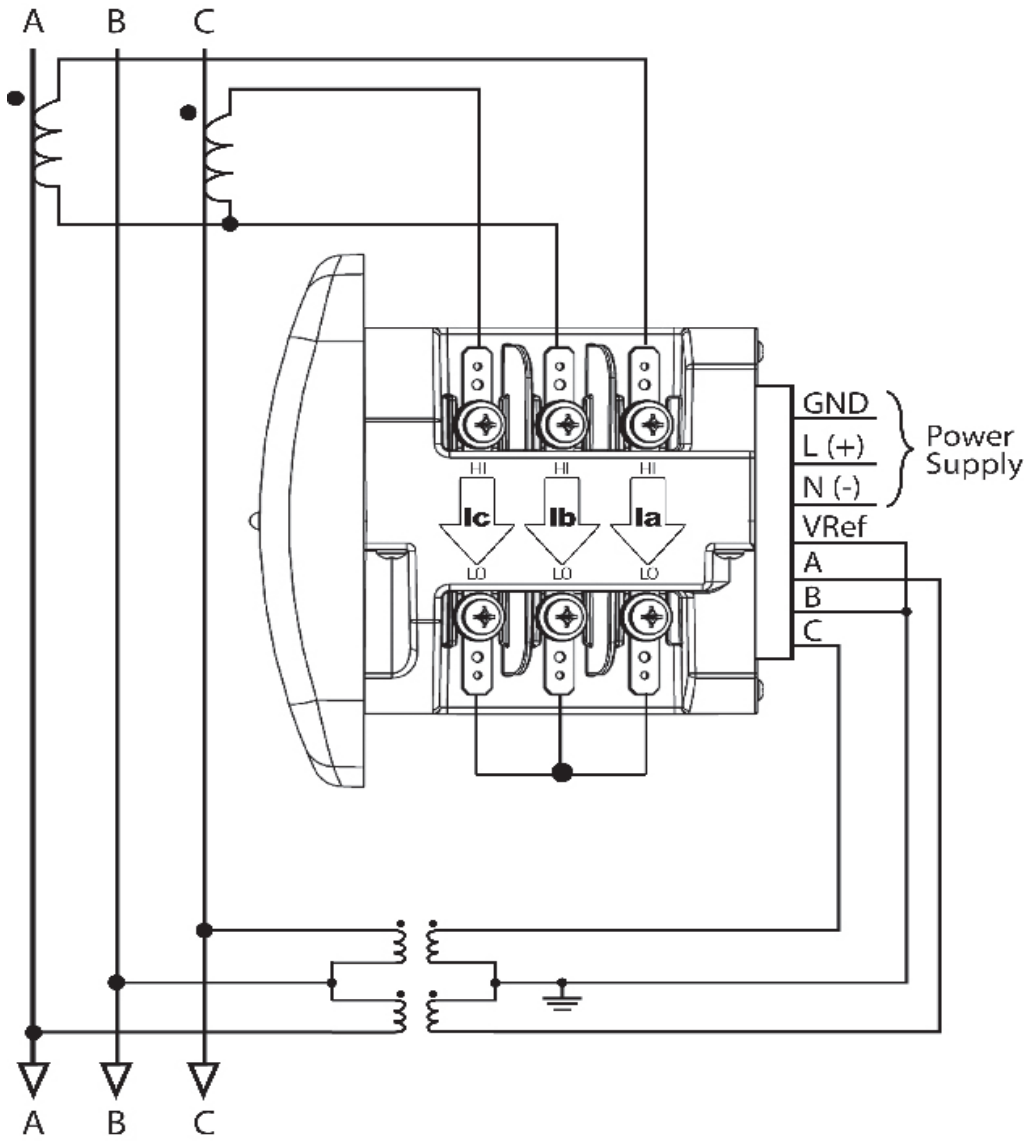
5. Service: Delta, 3-Wire with No PTs, 2 CTs

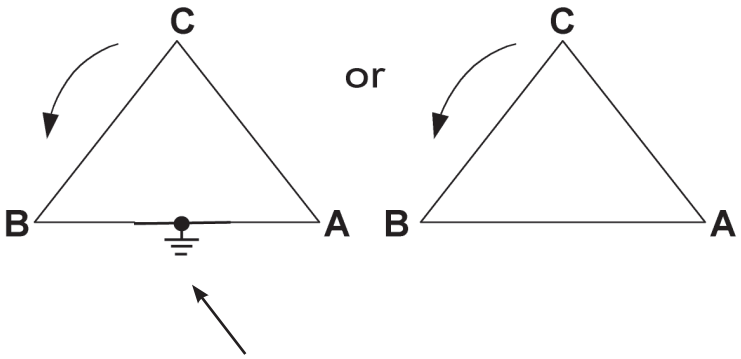




Select: "2 CT DEL" (2 CT Delta) from the Meter's Front Panel Display. (See Chapter 6.)

6. Service: Delta, 3-Wire with 2 PTs, 2 CTs

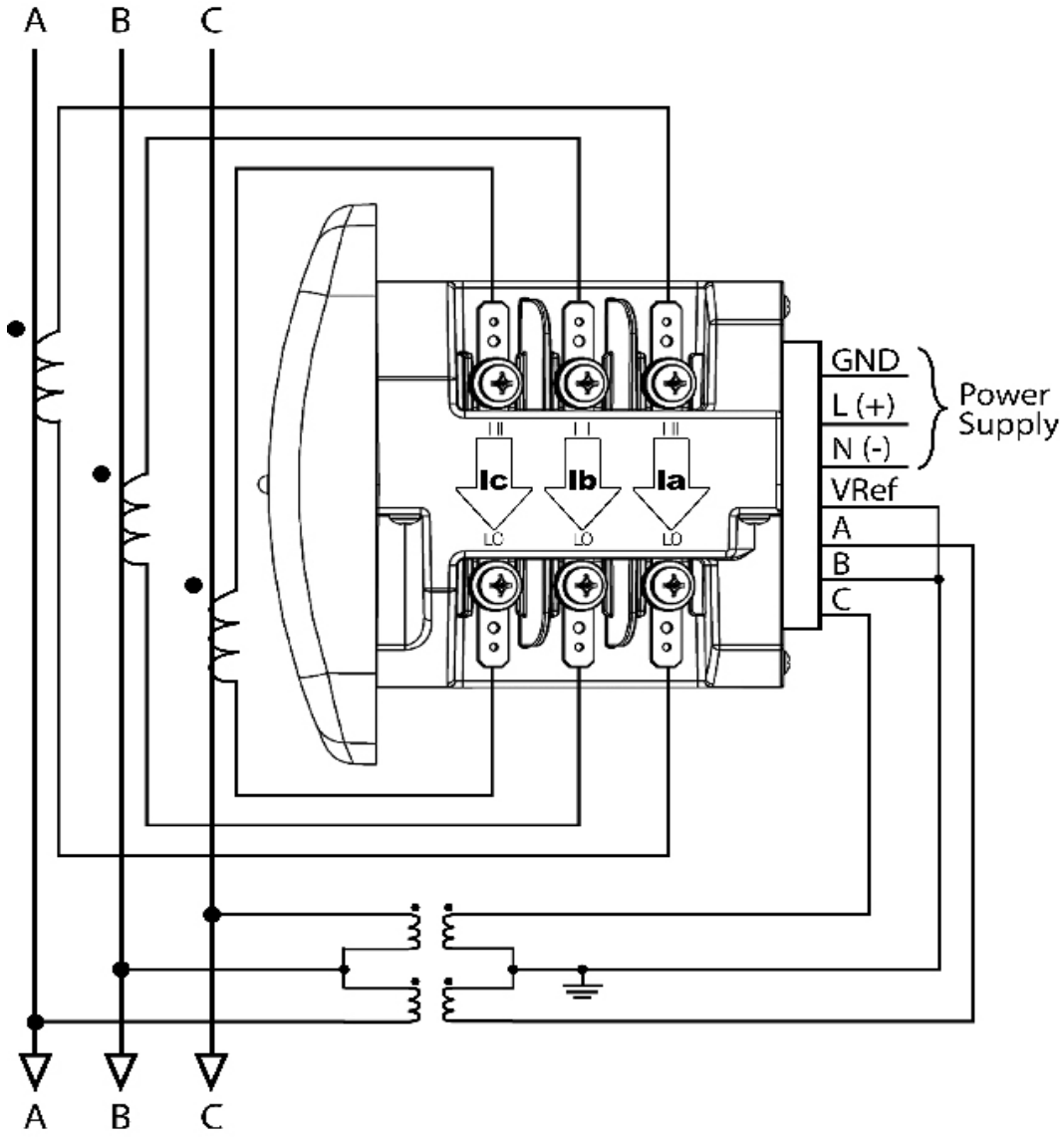


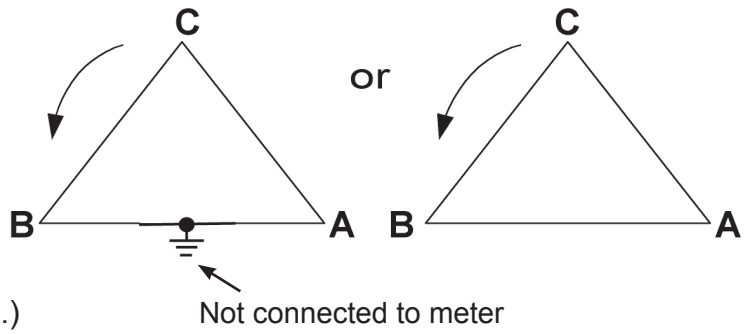


Select: "2 CT DEL" (2 CT Delta) from the Meter's Front Panel Display. (See Chapter 6.)

Not connected to meter

7. Service: Delta, 3-Wire with 2 PTs, 3 CTs

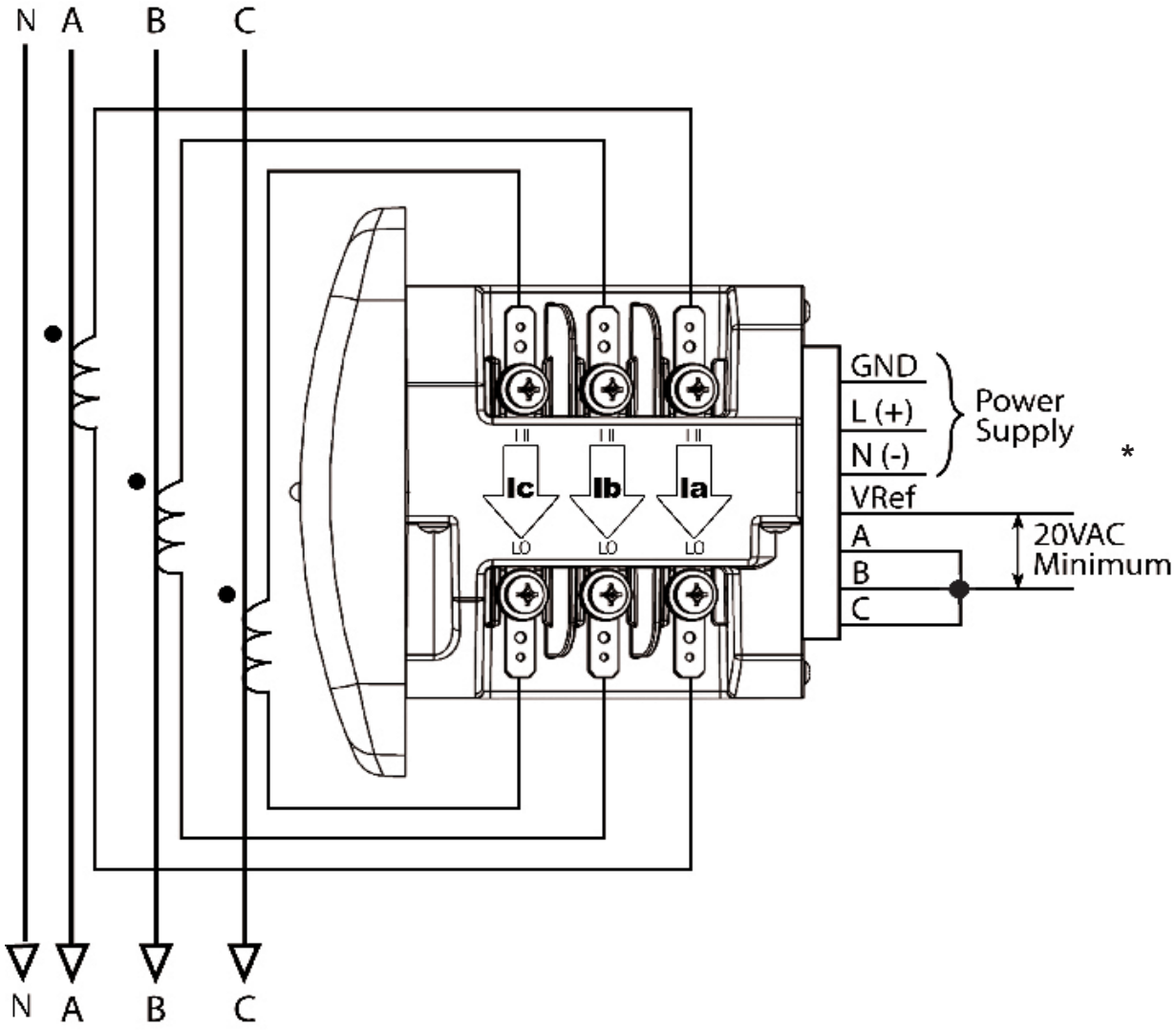




Select: "2 CT DEL" (2 CT Delta) from the Meter's Front Panel Display. (See Chapter 6.)

NOTE: The third CT for hookup is optional and is for Current Measurement only.

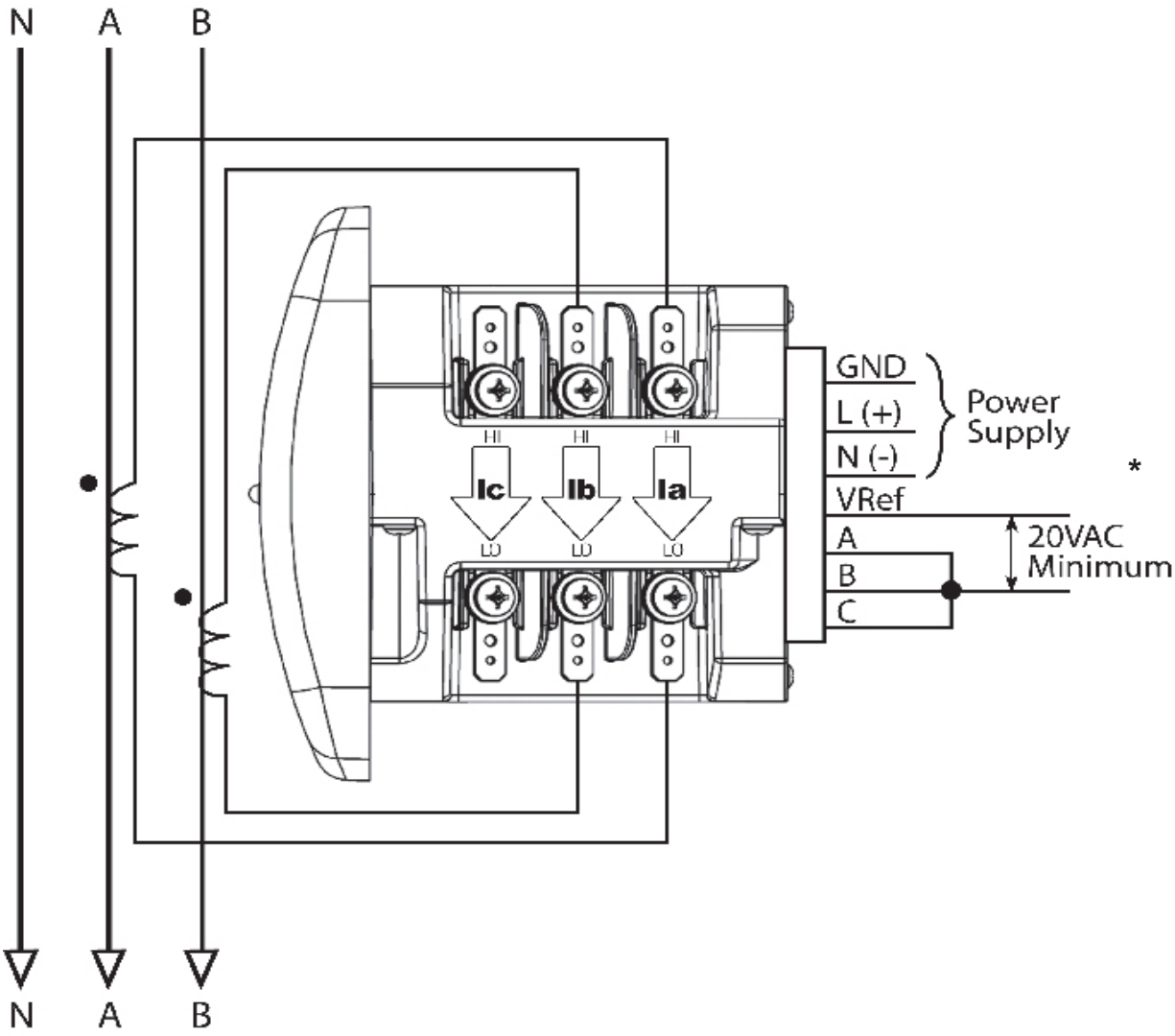
8. Service: Current Only Measurement (Three Phase)



Select: "3 EL WYE" (3 Element Wye) from the Meter's Front Panel Display. (See Chapter 6.)

* For improved accuracy, this connection is recommended, but not required.

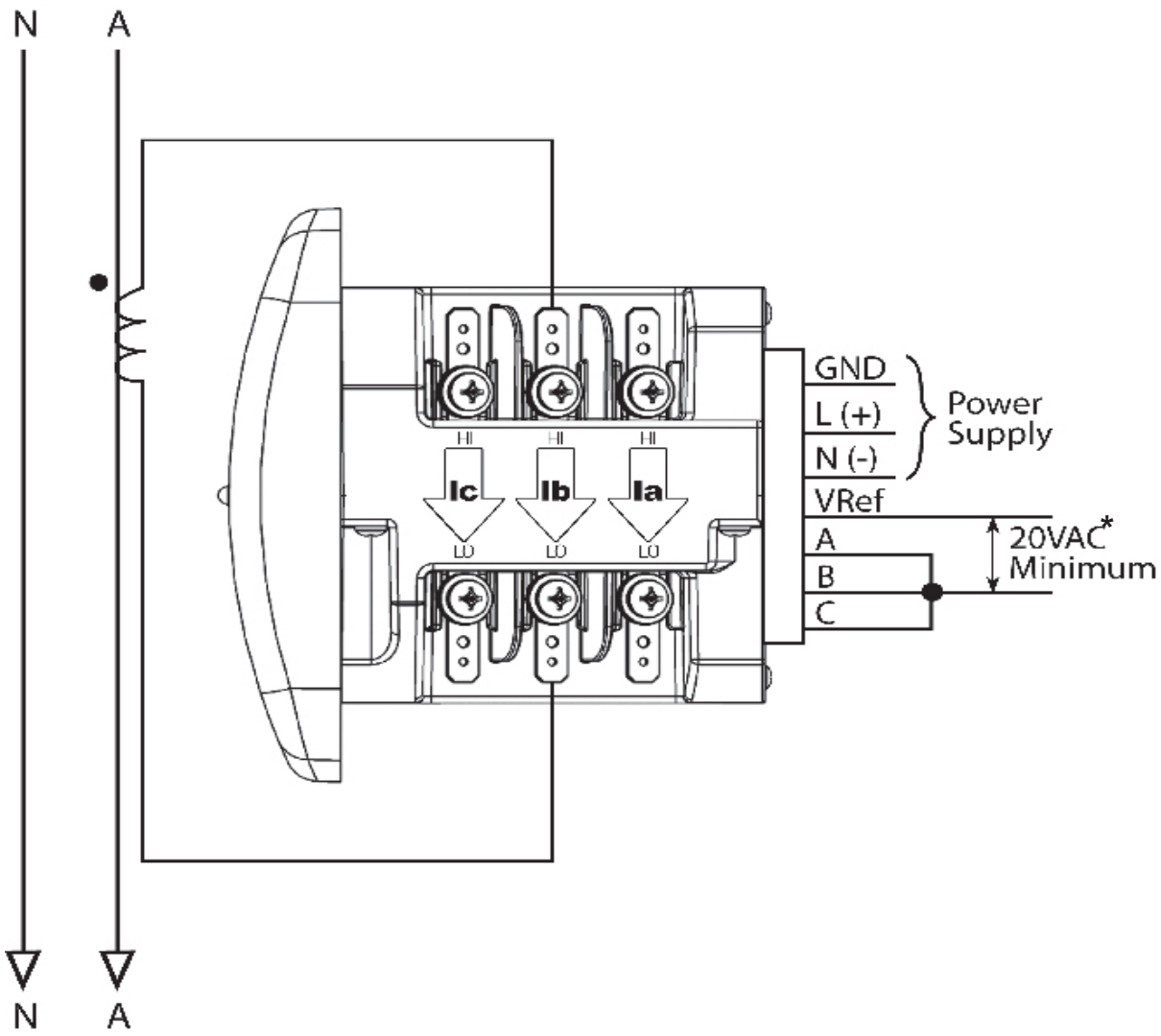
9. Service: Current Only Measurement (Dual Phase)



Select: " 3 EL WYE " (3 Element Wye) from the Meter's Front Panel Display. (See Chapter 6.)

* For improved accuracy, this connection is recommended, but not required.

10. Service: Current Only Measurement (Single Phase)



Select: " 3 EL WYE " (3 Element Wye) from the Meter's Front Panel Display. (See Chapter 6.)

* For improved accuracy, this connection is recommended, but not required.

5 SERIAL COMMUNICATION INSTALLATION

PXM 2000 Series Communication

The PXM 2000 Series provides RS485 communication speaking Modbus ASCII, Modbus RTU, and DNP 3.0 protocols.

RS485 / KYZ Output (Com 2)

Com 2 provides a combination RS485 and an Energy Pulse Output (KYZ pulse). See Chapter 2 for the KYZ Output Specifications; see Chapter 6 for Pulse Constants.

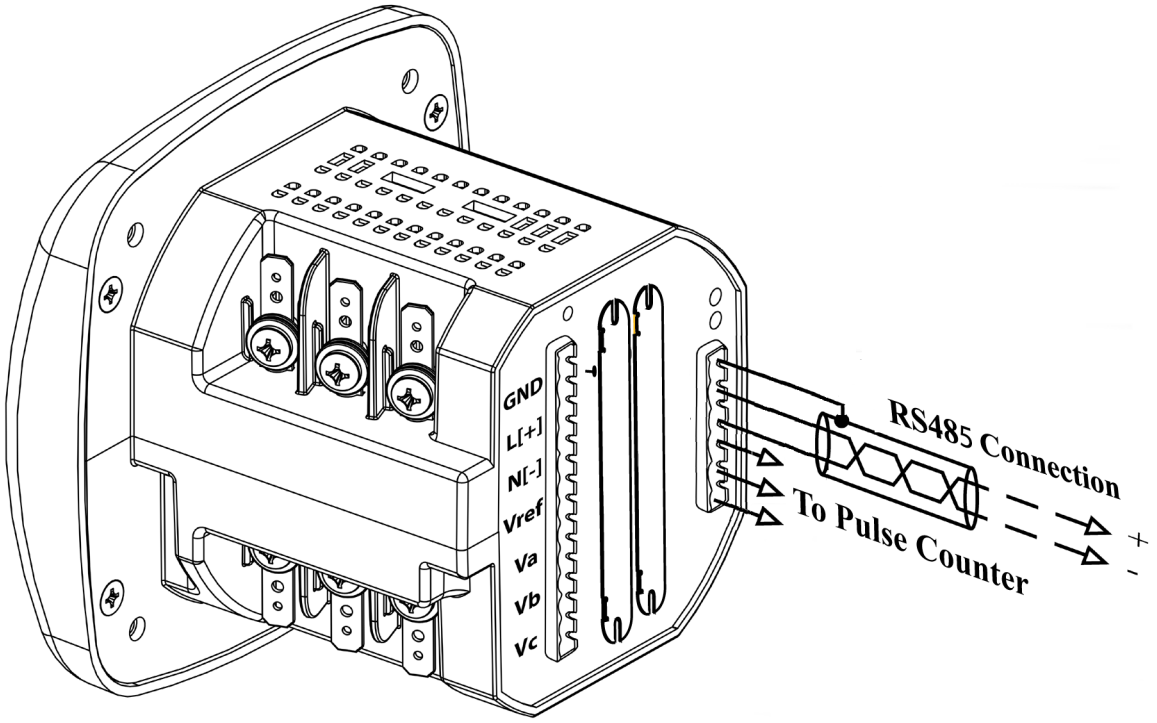


Figure 5.1: Meter Back with RS485 Communication Installation

RS485 allows you to connect one or multiple PXM 2000 Series meters to a PC or other device, at either a local or remote site. All RS485 connections are viable for up to 4000 feet (1219.20 meters).

Figure 5.2 shows the detail of a 2-wire RS485 connection.

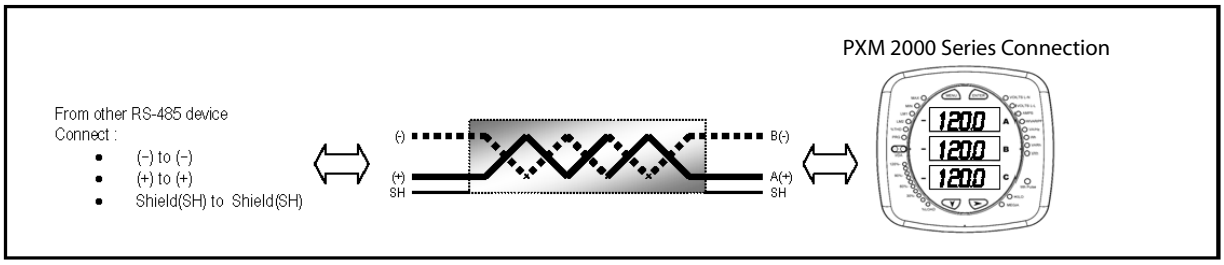


Figure 5.2: 2-wire RS485 Connection

NOTES:

For All RS485 Connections:

- Use a shielded twisted pair cable 22 AWG (0.33 mm^2) or thicker, and ground the shield, preferably at one location only.
- Establish point-to-point configurations for each device on a RS485 bus: connect (+) terminals to (+) terminals; connect (-) terminals to (-) terminals.
- You may connect up to 31 meters on a single bus using RS485. Before assembling the bus, each meter must have a unique address: refer to Chapter 8 for instructions.
- Protect cables from sources of electrical noise.
- Avoid both “Star” and “Tee” connections (see Figure 5.4).
- **No more than two cables** should be connected **at any one point** on an RS485 network, whether the connections are for devices, converters, or terminal strips.
- Include all segments when calculating the total cable length of a network. If you are **not** using an RS485 repeater, the maximum length for cable connecting all devices is 4000 feet (1219.20 meters).
- Connect shield to RS485 Master and individual devices as shown in Figure 5.3. You may also connect the shield to earth-ground at one point.
- **Termination Resistors** (R_T) may be needed on both ends for longer length transmission lines. However, since the meter has some level of termination internally, Termination Resistors may not be needed. When they are used, the value of the Termination Resistors is determined by the electrical parameters of the cable.

Figure 5.3 shows a representation of an RS485 Daisy Chain connection.

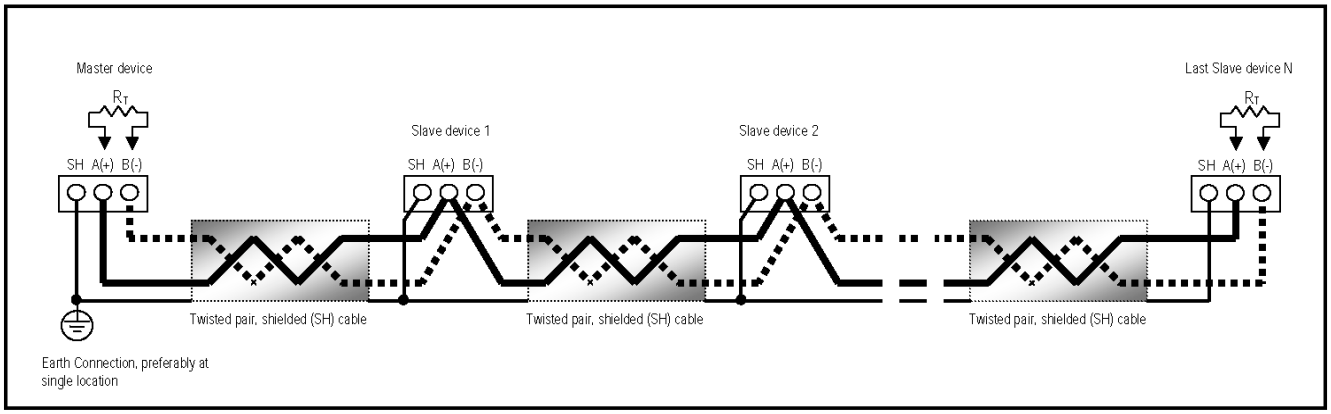


Figure 5.3: RS485 Daisy Chain Connection

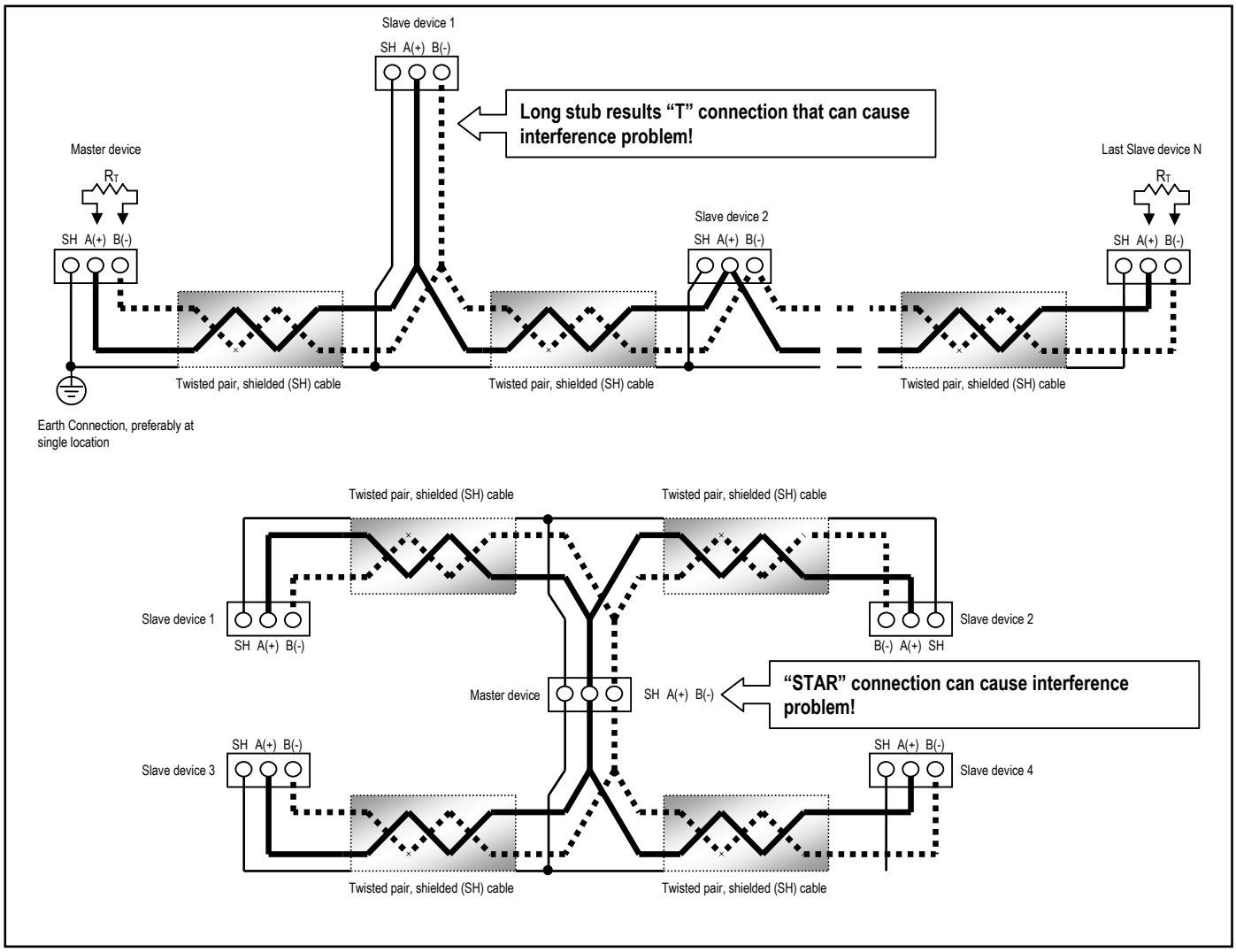


Figure 5.4: Incorrect "T" and "Star" Topologies

PXM 2000 Series Transducer Communication Information

The PXM 2000 Series Transducer does not include a display or buttons on the front face of the meter. Programming and communication utilize the RS485 connection on the back face of the meter shown in section 5.1.2. Once a connection is established, Eaton Meter Configuration Software can be used to program the meter and communicate to slave devices.

Meter Connection

To provide power to the meter, attach an **Aux cable** to GND, L(+) and N(-) Refer to Chapter 4, Figure 1.
The **RS485 cable** attaches to SH, B(-) and A(+) as shown in Figure 5.3 of this chapter.

6 USING THE PXM 2000 SERIES

Introduction

You can use the **Elements** and **Buttons** on the meter's face to view meter readings, reset and/or configure the PXM 2000 Series, and perform related functions. The following sections explain the Elements and Buttons and detail their use.

Understanding Meter Face Elements

The meter face features the following elements:

- **Reading Type Indicator:**
  Indicates Type of Reading
- **Parameter Designator:**
  Indicates Reading Displayed
- **Watt-Hour Test Pulse:**
  Energy Pulse Output to Test Accuracy
- **Scaling Factor:**
  Kilo or Mega multiplier of Displayed Readings
- **% of Load Bar:**
  Graphic Display of Amps as % of the Load

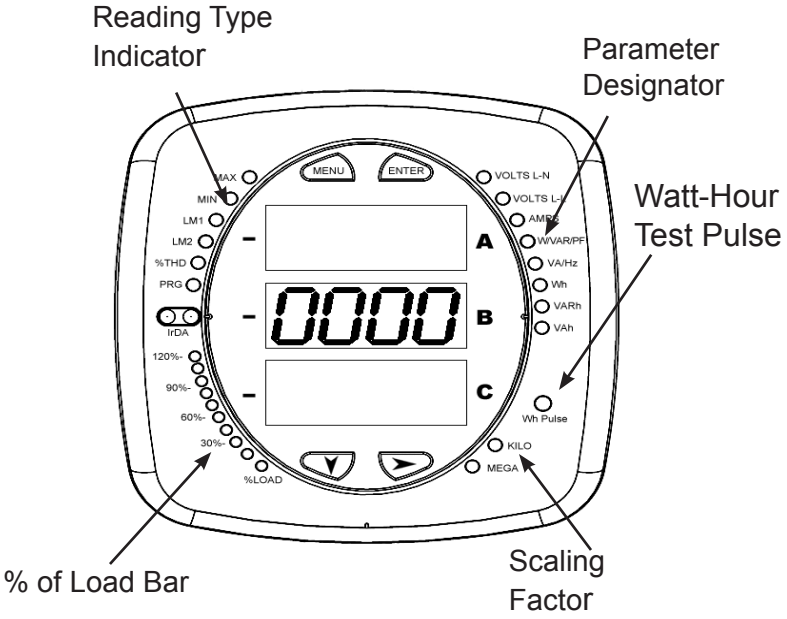


Figure 6.1: Meter's Face Plate with Elements

Understanding Meter Face Buttons

The meter face has **Menu**, **Enter**, **Down** and **Right** buttons, which allow you to perform the following functions:

- View Meter Information
- Enter Display Modes
- Configure Parameters (may be Password Protected)
- Perform Resets (may be Password Protected)
- Perform LED Checks
- Change Settings
- View Parameter Values
- Scroll Parameter Values
- View Limit States

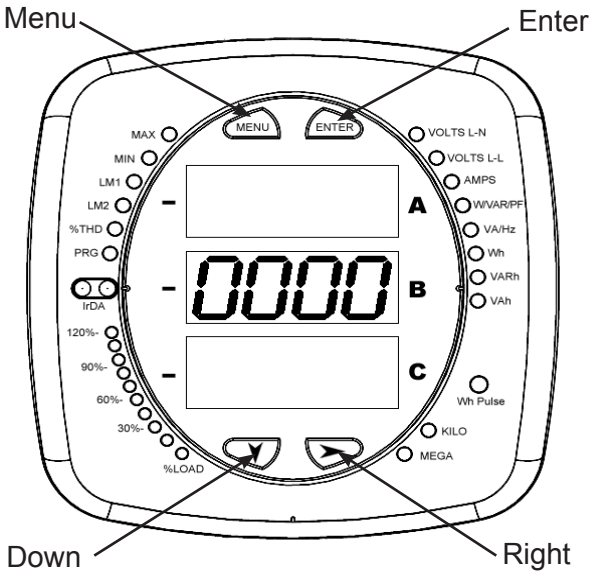


Figure 6.2: Meter's Face Plate with Buttons

Using the Front Panel

You can access **four** modes using the meter's front panel buttons:

- **Operating Mode** (Default)
- **Reset Mode**
- **Configuration Mode**
- **Information Mode**. **Information Mode** displays a sequence of screens that show model information, such as **Frequency** and **Amps**.

Use the **Menu**, **Enter**, **Down** and **Right** buttons to navigate through each mode and its related screens.

NOTES:

- *Appendix A* contains the complete **Navigation Map** for the front panel display modes and their screens.
- The meter can also be configured from the web pages; see Chapter 8 for instructions.

Understanding Startup and Default Displays

Upon Power Up, the meter displays a sequence of screens:

- **Lamp Test Screen** where all LEDs are lit
- **Lamp Test Screen** where all digits are lit
- **Firmware Screen** showing build number
- **Error Screen** (if an error exists).

After startup, if auto-scrolling is enabled, the meter scrolls the parameter readings on the right side of the front panel. The Kilo or Mega LED lights, showing the scale for the Wh, VARh and VAh readings. Figure 6.3 shows an example of a Wh reading.

The meter continues to provide scrolling readings until one of the buttons on the front panel is pressed, causing the meter to enter one of the other Modes.

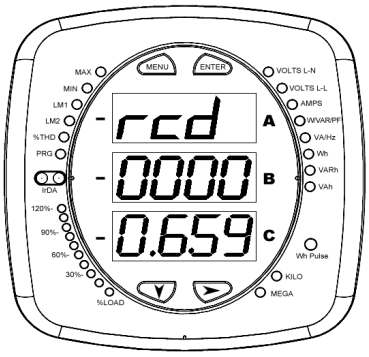
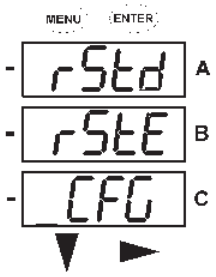
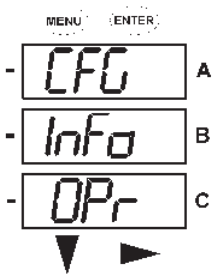


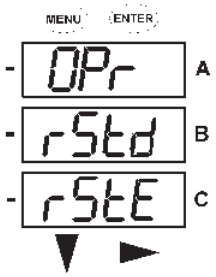
Figure 6.3: Wh Reading

Using the Main Menu

1. Press the **Menu** button. The Main Menu screen appears.
   - The **Reset: Demand** mode (**rStd**) appears in the A window. Use the **Down** button to scroll, causing the **Reset: Energy** (**rStE**), **Configuration** (**CFG), Operating** (**OPr**), and **Information (InFo)** modes to move to the **A window**.
   - The mode that is currently flashing in the **A** window is the "**Active**" mode, which means it is the mode that can be configured.







For example: Press **Down Twice- CFG** moves to A window. Press **Down** Twice - **OPr** moves to A window.

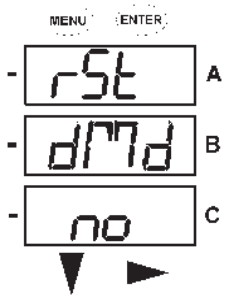
NOTE: If the PXM 2000 Meter has an Ethernet Gateway card, there is an IP menu option after InFo mode. Press Enter when IP is in the A window to see the IP Address. The IP address is displayed with 4 characters to a line, e.g., an IP address of 111.222.333.444 would appear as:
111.2
22.33
3.444
Note that it may take 2-3 minutes after Power up for the IP Address to display.

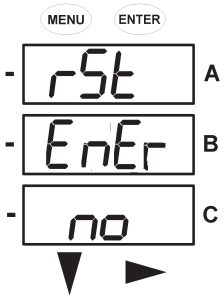
2. Press the **Enter** button from the Main Menu to view the Parameters screen for the mode that is currently active.

Using Reset Mode

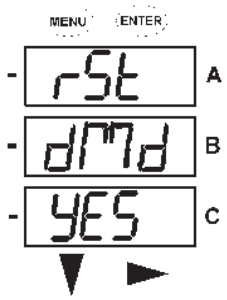
Reset Mode has **two options:**
- **Reset: Demand** (**rStd**): resets the Max and Min values.
- **Reset: Energy** (**rStE**): resets the energy accumulator fields.

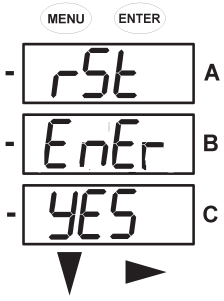
Press the **Enter** button while either **rStd** or **rStE** is in the A window. The **Reset Demand No or Reset Energy No** screen appears.





- If you press the **Enter** button again, the Main Menu appears, with **the next mode** in the A window. (The **Down** button does not affect this screen.)





- If you press the **Right** button, the **Reset Demand YES** or **Reset Energy YES** screen appears.
  Press **Enter** to perform a reset.
  NOTE: If Password Protection is enabled for Reset, you must enter the four digit Password before you can reset the meter. (See Chapter 8 for information on Password Protection.)
  To enter a password, follow the instructions on the next page.
  CAUTION! Reset Demand YES resets **all** Max and Min values.

Once you have performed a reset, the screen displays either "**rSt dMd donE**" or "**rSt EnEr donE**"and then resumes auto-scrolling parameters.

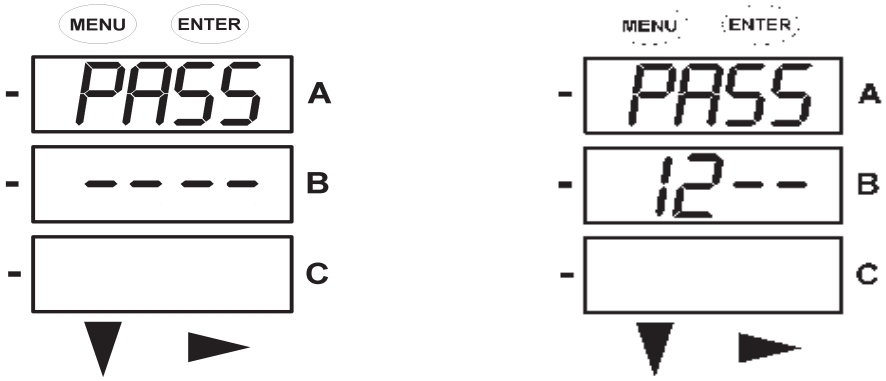
Entering a Password

If Password Protection has been enabled from the web pages for Reset and/or Configuration (see Chapter 8 for information), a screen appears requesting a Password when you try to reset the meter and/or configure settings through the front panel.

- **PASS** appears in the A window and 4 dashes appear in the B window. The leftmost dash is flashing.

1. Press the **Down** button to scroll numbers from 0 to 9 for the flashing dash. When the correct number appears for that dash, use the the **Right** button to move to the next dash.

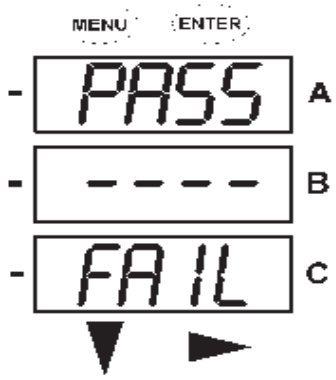
   Example: The left screen, below, shows four dashes. The right screen shows the display after the first two digits of the password have been entered.



2. When all 4 digits of the password have been selected, press the **Enter** button.

   - If you are in **Reset Mode** and the correct Password has been entered, "**rSt dMd donE**" or "**rSt EnEr donE**"appears and the screen resumes auto-scrolling parameters.
   - If you are in **Configuration Mode** and the correct Password has been entered, the display returns to the screen that required a password.

   - If an incorrect Password has been entered, "**PASS ---- FAIL**" appears, and:
     - The previous screen is redisplayed, if you are in **Reset Mode**.
     - The previous Operating Mode screen is redisplayed, if you are in **Configuration Mode**.

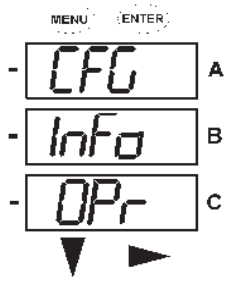


Using Configuration Mode

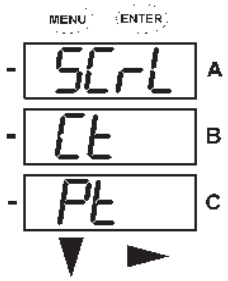
Configuration Mode follows Reset: Energy on the Main Menu.

To access **Configuration Mode**:

1. Press the **Menu** button while the meter is auto-scrolling parameters.
2. Press the **Down** button until the Configuration Mode option (**CFG**) is in the A window.
3. Press the **Enter** button. The **Configuration Parameters** screen appears.
4. Press the **Down** button to scroll through the configuration parameters: **Scroll (SCrL)**, **CT**, **PT**, **Connection (Cnct)** and **Port**. The parameter currently 'Active," i.e., configurable, flashes in the A window.
5. Press the **Enter** button to access the Setting screen for the currently active parameter.
   NOTE: **You can use the Enter button to scroll through all of the Configuration parameters and their Setting screens, in order.**



Press **Enter** when CFG is in A window -



Parameter screen appears - Press **Down**- Press **Enter** when Parameter you want is in A window

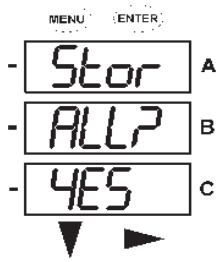
6. The parameter screen appears, showing the current settings. To change the settings:
   • Use either the **Down** button or the **Right** button to select an option.
   • To enter a number value, use the **Down** button to select the number value for a digit and the **Right** button to move to the next digit.

   NOTE: When you try to change the current setting and Password Protection is enabled for the meter, the Password screen appears. **See the previous page for instructions on entering a password**.

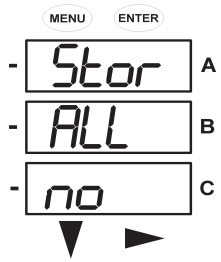
7. Once you have entered the new setting, press the **Menu** button twice.

8. The **Store ALL YES** screen appears. You can either:
   • Press the **Enter** button to **save** the new setting.
   • Press the **Right** button to access the **Store ALL no** screen; then press the Enter button to **cancel** the Save.

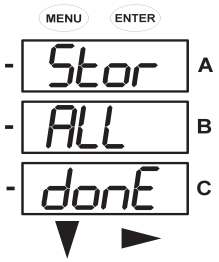
9. If you have saved the settings, the **Store ALL done** screen appears and the meter resets.



Press the Enter button to save the settings
Press the Right button for Stor All no screen



Press the Enter button to Cancel the save



The settings have been saved

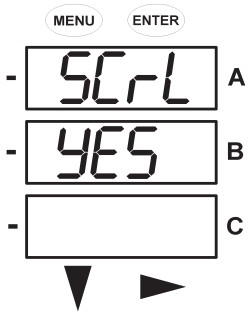
Configuring the Scroll Feature

When in **Auto Scroll** mode, the meter performs a scrolling display, showing each parameter for 7 seconds, with a 1 second pause between parameters. The parameters that the meter displays are determined by the following conditions:

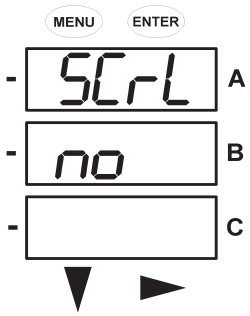
- They have been selected through software. (Refer to Chapter 8 for instructions.)
- Whether your meter model is a PXM 2250, 2260, or 2270.

To enable or disable Auto-scrolling:

1. Press the **Enter** button when **SCrl** is in the A window.
   The **Scroll YES** screen appears.



2. Press either the **Right** or **Down** button if you want to access the **Scroll no** screen.
   To return to the **Scoll YES** screen, press either button.



3. Press the **Enter** button on either the **Scroll YES** screen (to enable auto-scrolling) or the **Scroll no** screen (to disable auto-scrolling).
   The **CT- n** screen appears (this is the next Configuration mode parameter).

NOTE:

- To exit the screen without changing scrolling options, press the **Menu** button.
- To return to the Main Menu screen, press the **Menu** button twice.
- To return to the scrolling (or non-scrolling) parameters display, press the **Menu** button three times.

Configuring CT Setting

The CT Setting has three parts: **Ct-n** (numerator), **Ct-d** (denominator), and **Ct-S** (scaling).

1. Press the **Enter** button when Ct is in the A window.
   The **Ct-n** screen appears. You can either:
   - Change the value for the CT numerator.
   - Access one of the other CT screens by pressing the Enter button: press Enter once to access the **Ct-d** screen, twice to access the **Ct-S** screen.

   NOTE: The Ct-d screen is preset to a 5 amp or 1 amp value at the factory and cannot be changed.

   a. **To change the value for the CT numerator**

   From the Ct-n screen:
   - Use the **Down** button to select the number value for a digit.
   - Use the **Right** button to move to the next digit.

   b. **To change the value for CT scaling**

   From the Ct-S screen:
   Use the **Right** button or the **Down** button to choose the scaling you want. The Ct-S setting can be **1**, **10**, or **100**.

   NOTE: If you are prompted to enter a password, refer to the instructions earlier in the chapter.

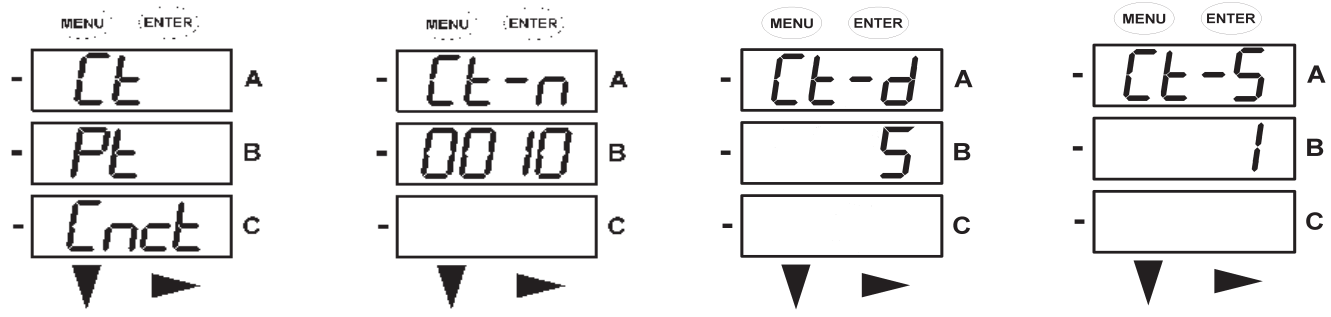
2. When the new setting is entered, press the **Menu** button twice.

3. The **Store ALL YES** screen appears. Press **Enter** to save the new CT setting.

Example CT Settings:

200/5 Amps:	Set the Ct-n value for 200 and the Ct-S value for 1.
800/5 Amps:	Set the Ct-n value for 800 and the Ct-S value for 1.
2,000/5 Amps:	Set the Ct-n value for 2000 and the Ct-S value for 1.
10,000/5 Amps:	Set the Ct-n value for 1000 and the Ct-S value for 10.

NOTES:
- The value for Amps is a product of the Ct-n value and the Ct-S value.
- Ct-n and Ct-S are dictated by primary current; Ct-d is secondary current.



Press **Enter** | Use buttons to set Ct-n value | The Ct-d cannot be changed | Use buttons to select scaling

Configuring PT Setting

The PT Setting has three parts: **Pt-n** (numerator), **Pt-d** (denominator), and **Pt-S** (scaling).

1. Press the **Enter** button when Pt is in the A window.
   The **PT-n** screen appears. You can either:
   - Change the value for the PT numerator.
   - Access one of the other PT screens by pressing the **Enter** button: press **Enter** once to access the **Pt-d** screen, twice to access the **Pt-S** screen.

   a. **To change the value for the PT numerator or denominator**

   From the Pt-n or Pt-d screen:
   - Use the **Down** button to select the number value for a digit.
   - Use the **Right** button to move to the next digit.

   b. **To change the value for the PT scaling**

   From the Pt-S screen:
   Use the **Right** button or the **Down** button to choose the scaling you want. The Pt-S setting can be **1**, **10**, **100, or 1000**.

   NOTE: If you are prompted to enter a password, refer to the instructions earlier in this chapter.

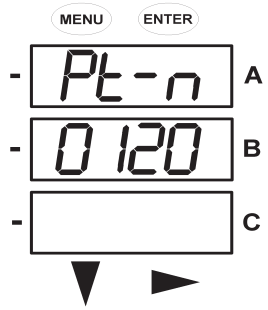
2. When the new setting is entered, press the **Menu** button twice.

3. The **STOR ALL YES** screen appears. Press Enter to save the new PT setting.

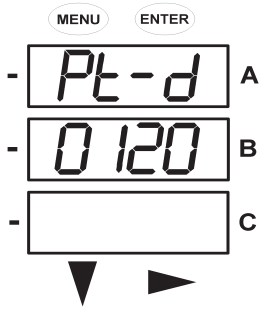
Example Settings:

277/277 Volts:	Pt-n value is 277, Pt-d value is 277, Pt-S value is 1.
14,400/120 Volts:	Pt-n value is 1440, Pt-d value is 120, Pt-S value is 10.
138,000/69 Volts:	Pt-n value is 1380, Pt-d value is 69, Pt-S value is 100.
345,000/115 Volts:	Pt-n value is 3450, Pt-d value is 115, Pt-S value is 100.
345,000/69 Volts:	Pt-n value is 345, Pt-d value is 69, Pt-S value is 1000.

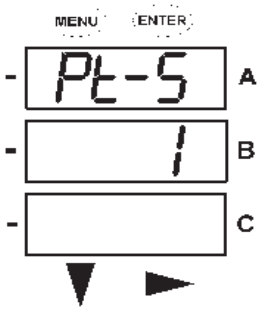
NOTE: Pt-n and Pt-S are dictated by primary voltage; Pt-d is secondary voltage.



Use buttons to set Pt-n value



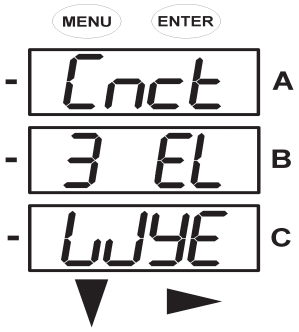
Use buttons to set Pt-d value



Use buttons to select scaling

Configuring Connection Setting

1. Press the **Enter** button when **Cnct** is in the A window. The **Cnct** screen appears.
2. Press the **Right** button or **Down** button to select a configuration.
   The choices are:
   • 3 Element Wye (**3 EL WYE**)
   • 2.5 Element Wye (**2.5EL WYE**)
   • 2 CT Delta (**2 Ct dEL**)
   NOTE: If you are prompted to enter a password, refer to the instructions earlier in this chapter.
3. When you have made your selection, press the **Menu** button twice.
4. The **STOR ALL YES** screen appears. Press **Enter** to save the setting.



Use buttons to select configuration

Configuring Communication Port Setting

Port configuration consists of : **Address** (a three digit number), **Baud Rate** (9600; 19200; 38400; or 57600), and **Protocol** (DNP 3.0; Modbus RTU; or Modbus ASCII).

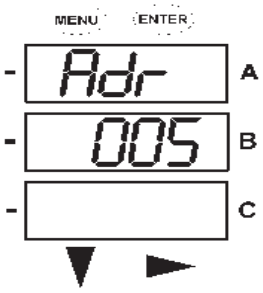
1. Press the **Enter** button when **POrt** is in the A window.
   The **Adr** (address) screen appears. You can either:
   • Enter the address.
   • Access one of the other Port screens by pressing the **Enter** button: press **Enter** once to access the **bAUd** screen (Baud Rate); press **Enter** twice to access the **Prot** screen (Protocol).

   a. **To enter the Address, from the Adr screen:**
      • Use the **Down** button to select the number value for a digit.
      • Use the **Right** button to move to the next digit.

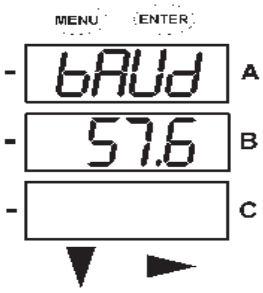
   b. **To select the Baud Rate, from the bAUd screen:**
      Use the **Right** button or the **Down** button to select the setting you want.

   c. **To select the Protocol, from the Prot screen:**
      Press the **Right** button or the **Down** button to select the setting you want.

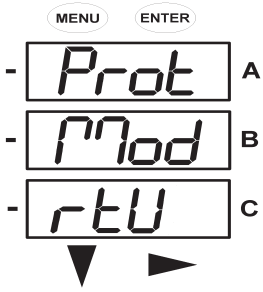
      NOTE: If you are prompted to enter a password, refer to the instructions earlier in this chapter.
2. When you have finished making your selections, press the **Menu** button twice.
3. The **STOR ALL YES** screen appears. Press **Enter** to save the settings.



Use buttons to enter Address



Use buttons to select Baud Rate



Use buttons to select Protocol

Using Operating Mode

Operating Mode is the PXM 2000 Series' default mode, that is, the standard front panel display. After Startup, the meter automatically scrolls through the parameter screens, if scrolling is enabled. Each parameter is shown for 7 seconds, with a 1 second pause between parameters. Scrolling is suspended for 3 minutes after any button is pressed.

1. Press the **Down** button to scroll all the parameters in **Operating Mode**. The currently "Active," i.e., displayed, parameter has the Indicator light next to it, on the right face of the meter.
2. Press the **Right** button to view additional readings for that parameter. The table below shows possible readings for Operating Mode. **Sheet 2** in *Appendix A* shows the Operating Mode Navigation Map.
   NOTE: Readings or groups of readings are skipped if not applicable to the meter type or hookup, or if they are disabled in the programmable settings.

OPERATING MODE PARAMETER READINGS

POSSIBLE READINGS

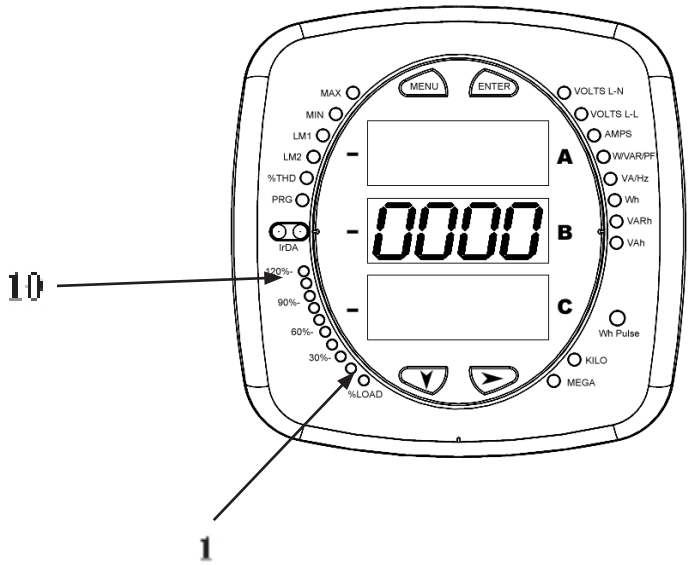
VOLTS L-N	VOLTS_LN	VOLTS_ LN_MAX	VOLTS_ LN_MIN			VOLTS_ LN_THD
VOLTS L-L	VOLTS_LL	VOLTS_LL_ MAX	VOLTS_LL_ MIN			
AMPS	AMPS	AMPS_ NEUTRAL	AMPS_ MAX	AMPS_MIN		AMPS_THD
W/VAR/PF	W_VAR_PF	W_VAR_ PF_MAX_ POS	W_VAR_ PF_MIN_ POS	W_VAR_ PF_MIN_ NEG		
VA/Hz	VA_FREQ	VA_FREQ_ MAX	VA_FREQ_ MIN			
Wh	KWH_REC	KWH_DEL	KWH_NET	KWH_TOT		
VARh	KVARH_ POS	KVARH_ NEG	KVARH_ NET	KVARH_ TOT		
VAh	KVAH					

Understanding the % of Load Bar

The 10-segment LED bar graph at the bottom left of the meter's front panel provides a graphic representation of Amps. The segments light according to the load, as shown in the % Load Segment Table below.
When the Load is over 120% of Full Load, all segments flash "On" (1.5 secs) and "Off" (0.5 secs).

% of Load Segment Table

Segments	Load >= % Full Load
none	no load
1	1%
1-2	15%
1-3	30%
1-4	45%
1-5	60%
1-6	72%
1-7	84%
1-8	96%
1-9	108%
1-10	120%
All Blink	>120%



Performing Watt-Hour Accuracy Testing (Verification)

To be certified for revenue metering, power providers and utility companies must verify that the billing energy meter performs to the stated accuracy. To confirm the meter's performance and calibration, power providers use field test standards to ensure that the unit's energy measurements are correct. Since the PXM 2000 Series are traceable revenue meters, each model contains a utility grade test pulse that can be used to gate an accuracy standard. This is an essential feature required of all billing grade meters.

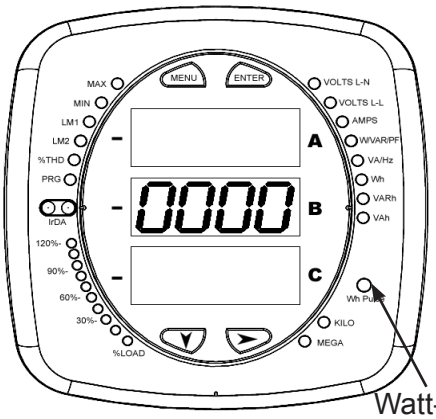


Figure 6.4: Watt-Hour Test Pulse

- Refer to Figure 6.5 for an example of how this process works.
- Refer to Table 6.1 for the Wh/Pulse Constants for Accuracy Testing.

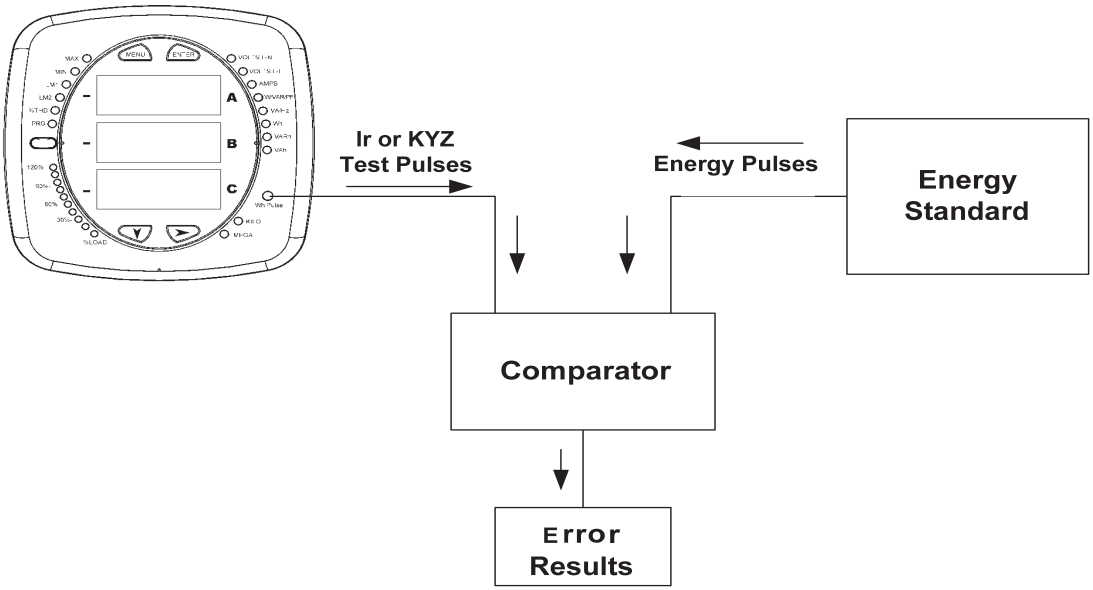


Figure 6.5: Using the Watt-Hour Test Pulse

Table 6.1: Infrared & KYZ Pulse Constants for Accuracy Testing - Kh Watthour per pulse

Input Voltage Level	Class 10 Models	Class 2 Models
Below 150V	0.500017776	0.1000035555
Above 150V	2.000071103	0.400014221

NOTE: Minimum pulse width is 90 milliseconds.

7 USING THE I/O OPTION CARDS

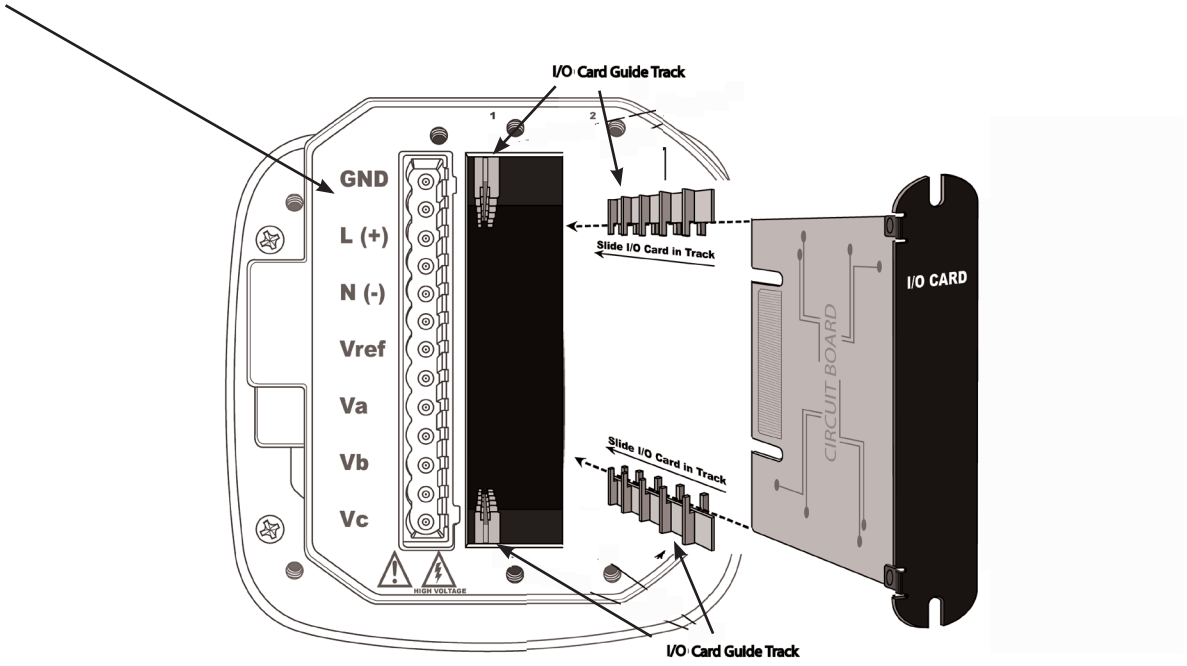
Overview

The PXM 2000 Series offers extensive **I/O expandability.** Using the one universal Option Card slot, the unit can be easily configured to accept a new I/O Option card even after installation, without your needing to remove it from the installation. The meter auto-detects any installed Option card. One module of any type outlined in this chapter can be used per meter.

Installing an Option Card

The Option Card is inserted in the Option Card slot in the back of the meter.
Note: Remove Voltage Inputs and power supply terminal from the meter before performing card installation.
1. Remove the screws at the top and the bottom of the Option Card slot cover.
2. There is a plastic “track” on the top and the bottom of the slot. The Option card fits into this track.

WARNING! For safety, remove these connections before installing Option Card: (GND,L, N, Vref, Va, Vb, Vc)



3. Slide the card inside the plastic track and insert it into the slot. You will hear a click when the card is fully inserted. **Be careful**, it is easy to miss the guide track.

CAUTIONS!
- Make sure the I/O card is inserted properly into the track to avoid damaging the card’s components.
- For proper fit of cards, and to avoid damaging the unit, insert components in the following order:
    1. Option Card
    2. Detachable terminal block 1

3. Detachable terminal block 2
4. Communication connection for RS485 Port

Configuring Option Cards

CAUTION! FOR PROPER OPERATION, RESET ALL PARAMETERS IN THE UNIT AFTER HARDWARE MODIFICATION.

The meter auto-detects any Option card installed in it. You configure the Option card through the Power Xpert® Ethernet Gateway card.

The following sections describe the available Option cards.

Digital Output (Relay Contact) / Digital Input Card (-1)

The Digital Output/Input card is a combination of relay contact outputs for load switching and dry/wet contact sensing digital inputs. The outputs are electrically isolated from the inputs and from the main unit.

Specifications

The technical specifications at 25 °C are as follows:

Power consumption:	0.320W internal
Relay outputs.	
Number of outputs:	2
Contact type:	Changeover (SPDT)
Relay type:	Mechanically latching
Switching voltage:	AC 250V / DC 30V
Switching power:	1250VA / 150W
Switching current:	5A
Switching rate max.:	10/s
Mechanical life:	5×10^7 switching operations
Electrical life:	10^5 switching operations at rated current
Breakdown voltage:	AC 1000V between open contacts
Isolation:	AC 3000V / 5000V surge system to contacts
Reset/Power down state:	No change - last state is retained
Inputs.	
Number of Inputs:	2
Sensing type:	Wet or dry contact status detection
Wetting voltage:	DC (12-24V), internally generated
Input current:	2.5mA – constant current regulated
Minimum input voltage:	0V (input shorted to common)
Maximum input voltage:	DC 150V (diode protected against polarity reversal)
Filtering:	De-bouncing with 50ms delay time
Detection scan rate:	100ms
Isolation:	AC 2500V system to inputs

The general specifications are as follows:

Operating temperature:	(-20 to +70) °C
Storage temperature:	(-40 to +80) °C
Relative air humidity:	Maximum 95%, non-condensing
EMC - Immunity Interference:	EN61000-4-2
Weight:	1.5oz
Dimensions (inch) W x H x L:	0.72 x 2.68 x 3.26
External Connection:	AWG 12-26/(0.129 - 3.31)mm^2 9 pin, 0.200” pluggable terminal block

Wiring Diagram

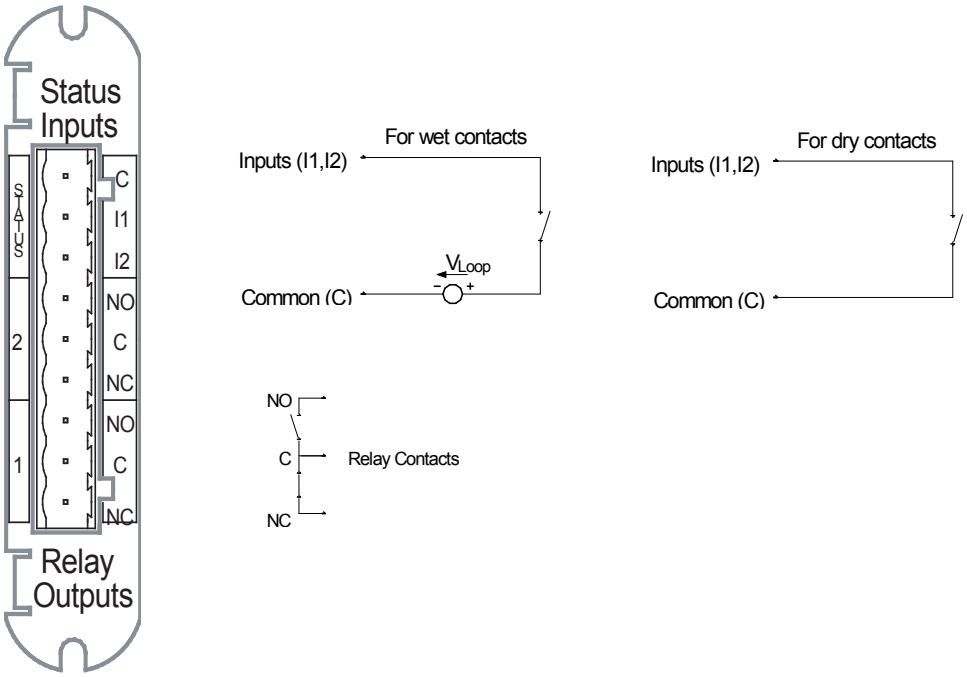


Fig. 7.3: Relay Contact (2) / Status Input (2) Card

Pulse Output (Solid State Relay Contacts) / Digital Input Card (-2)

The Pulse Output/Digital Input card is a combination of pulse outputs via solid state contacts and dry/wet contact sensing digital inputs. The outputs are electrically isolated from the inputs and from the main unit.

Specifications

The technical specifications at 25 °C are as follows:

Power consumption:	0.420W internal
Relay outputs	
Number of outputs:	4
Contact type:	Closing (SPST - NO)
Relay type:	Solid state
Peak switching voltage:	DC ±350V
Continuous load current:	120mA
Peak load current:	350mA for 10ms
On resistance, max.:	35Ω
Leakage current:	1µA@350V
Switching Rate max.:	10/s
Isolation:	AC 3750V system to contacts
Reset/Power down state:	Open contacts
Inputs	
Number of inputs:	4
Sensing type:	Wet or dry contact status detection
Wetting voltage:	DC (12-24V), internally generated
Input current:	2.5mA – constant current regulated
Minimum input voltage:	0V (input shorted to common)
Maximum input voltage:	DC 150V (diode protected against polarity reversal)
Filtering:	De-bouncing with 50ms delay time
Detection scan rate:	100ms
Isolation:	AC 2500V system to inputs

The general specifications are as follows:

Operating Temperature:	(-20 to +70) °C
Storage Temperature:	(-40 to +80) °C
Relative air humidity:	Maximum 95%, non-condensing
EMC - Immunity Interference:	EN61000-4-2
Weight:	1.3oz
Dimensions (inch) W x H x L:	0.72 x 2.68 x 3.26
External Connection:	AWG 12-26/(0.129 - 3.31)mm^2 13 pin, 3.5mm pluggable terminal block

Default Configuration:

The meter automatically recognizes the installed option card during Power Up. If you have not programmed a configuration for the card, the unit will default to the following outputs:

Status Inputs	Defaulted to Status Detect
Pulse Outputs	Defaulted to Energy Pulses
Pulse Channel 1	1.8 +Watt-hrs per pulse
Pulse Channel 2	1.8 -Watt-hrs per pulse
Pulse Channel 3	1.8 +VAR-hrs per pulse
Pulse Channel 4	1.8 -VAR-hrs per pulse

Wiring Diagram

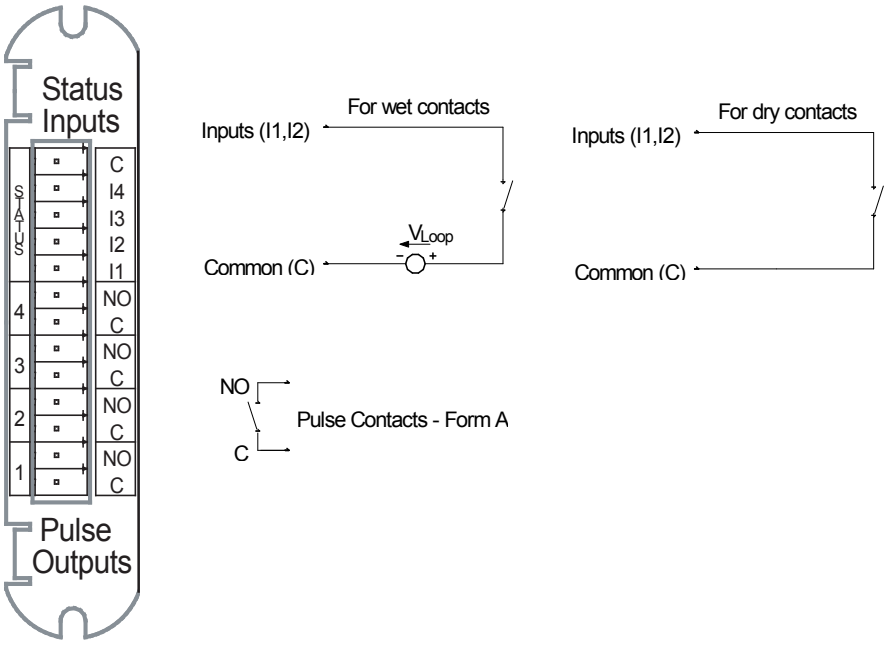


Fig. 7.4: Pulse Output (4) / Status Input (4) Card

1mA Output Card (-3)

The 1mA card transmits a standardized bi-directional 0-1mA signal. This signal is linearly proportional to real-time quantities measured by the meter. The outputs are electrically isolated from the main unit.

Specifications:

The technical specifications at 25° C at 5kΩ load are as follows:

Number of outputs:	4 single ended
Power consumption:	1.2W internal
Signal output range:	(-1.2 to +1.2)mA
Max. load impedance:	10kΩ
Hardware resolution:	12 bits
Effective resolution:	14 bits with 2.5kHz PWM
Update rate per channel:	100ms
Output accuracy:	± 0.1 % of output range (2.4mA)
Load regulation	± 0.06 % of output range (2.4mA) load step of 5kΩ @ ± 1mA
Temperature coefficient	± 30nA/°C
Isolation:	AC 2500V system to outputs
Reset/Default output value:	0mA

The general specifications are as follows:

Operating temperature:	(-20 to +70) °C
Storage temperature:	(-40 to +80) °C
Relative air humidity:	Maximum 95%, non-condensing
EMC - Immunity Interference:	EN61000-4-2
Weight:	1.6oz
Dimensions (inch) W x H x L:	0.72 x 2.68 x 3.26
External connection:	AWG 12-26/(0.29 - 3.31) mm^2 5 pin, 0.200” pluggable terminal block

Default Configuration:

The meter automatically recognizes the installed option card during Power Up. If you have not programmed a configuration for the card, the unit will default to the following outputs:

Channel 1+Watts, +1800 Watts => +1mA
-Watts, - 1800 Watts => -1mA

Channel 2+VARs, +1800 VARs => +1mA
- VARs, -1800 VARs => -1mA

Channel 3 Phase A Voltage WYE, 300 Volts => +1mA
Phase A Voltage Delta, 600 Volts => +1mA

Channel 4 Phase A Current, 10 Amps => +1mA

Wiring Diagram

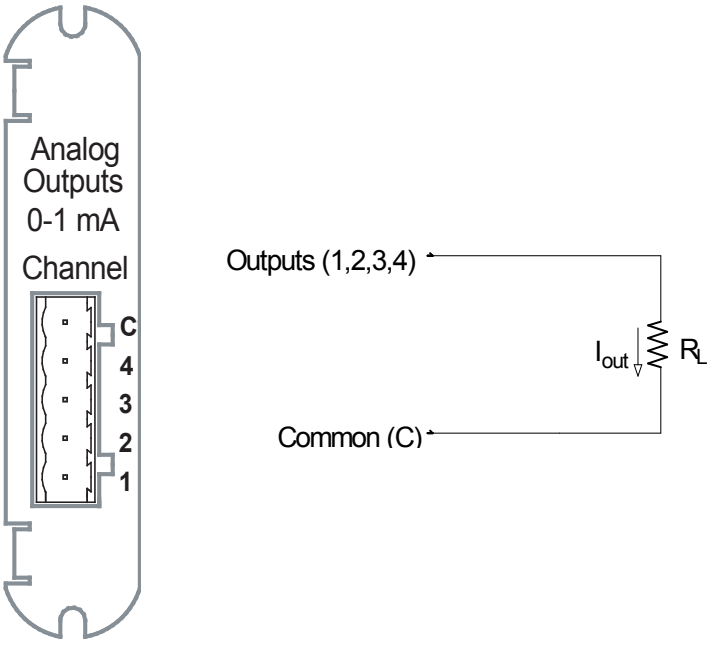


Fig 7.5: 4-Channel 0 - 1mA Output Card

20mA Output Card (-4)

The 20mA card transmits a standardized 0-20 mA signal. This signal is linearly proportional to real-time quantities measured by the meter. **The current sources need to be loop powered.** The outputs are electrically isolated from the main unit.

Specifications

The technical specifications at 25° C at 500Ω load are as follows:

Number of outputs:	4 single ended
Power consumption:	1W internal
Signal output range:	(0 to 24)mA
Max. load impedance:	850 Ω @ 24VDC
Hardware resolution:	12 bits
Effective resolution:	14 bits with 2.5kHz PWM
Update rate per channel:	100ms
Output accuracy:	± 0.1 % of output range (24mA)
Load regulation:	± 0.03 % of output range (24mA) load step of 200Ω @ 20mA
Temperature coefficient	± 300n A/°C
Isolation:	AC 2500V system to outputs
Maximum loop voltage:	28Vdc max
Internal voltage drop:	3.4VDC @ 24mA
Reset/Default output value:	12mA

The general specifications are as follows:

Operating temperature:	(-20 to +70) °C
Storage temperature:	(-40 to +80) °C
Relative air humidity:	Maximum 95%, non-condensing
EMC - Immunity interference:	EN61000-4-2
Weight:	1.6oz
Dimensions (inch) W x H x L:	0.72 x 2.68 x 3.26
External connection:	AWG 12-26/(0.129 - 3.31)mm^2 5 pin, 0.200” pluggable terminal block

Default Configuration:

The meter automatically recognizes the installed option card during Power Up. If you have not programmed a configuration for the card, the unit will default to the following outputs:

Channel 1+Watts, +1800 Watts => 20mA
-Watts, -1800 Watts => 4mA
0 Watts => 12mA

Channel 2+VARs, +1800 VARs => 20mA
- VARs, -1800 VARs => 4mA
0 VARs => 12mA

Channel 3 Phase A Voltage WYE, 300 Volts => 20mA
0 Volts => 4 mA
Phase A Voltage Delta, 600 Volts => 20mA

Channel 4 Phase A Current, 10 Amps => 20mA
0 Phase A Current, 0 Amps => 4 mA

Wiring Diagram

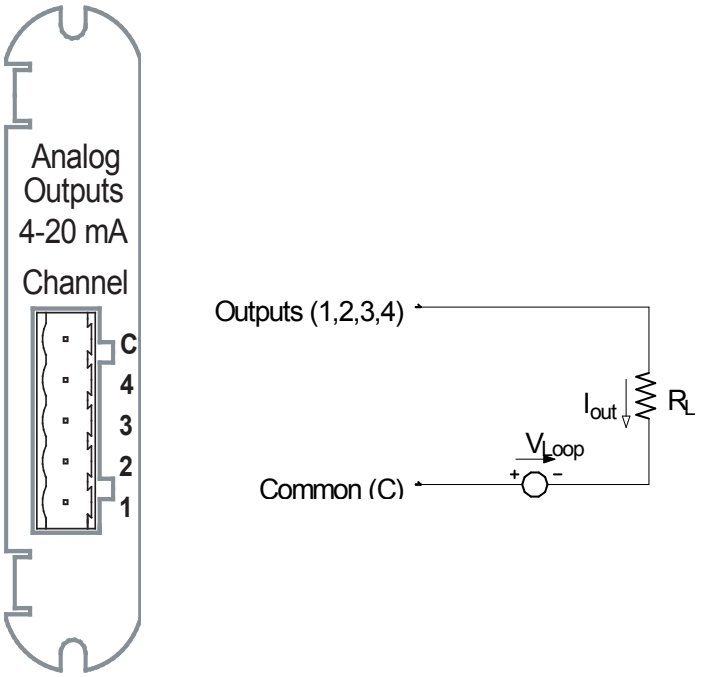


Fig. 7.6: 4-Channel 4 - 20mA Output Card

Network Communications with the Power Xpert® 2000 Series (-5)

The Power Xpert® Meter Gateway Card provides the PXM 2000 Series with Ethernet capability.
NOTE: Network configuration will be done through the card.

Specifications

The technical specifications at 25° C are as follows:

Number of ports:	1
Power consumption:	<2.0 Watts internal
Data rate:	10/100Mbit
Diagnostic features:	100 Mbit LINK and for ACTIVITY. There are also four LEDs for Power, Firmware upgrade activity, DHCP use, and meter communication status.
Number of simultaneous Modbus connections:	Ten

The general specifications are as follows:

Operating temperature:	(-20 to +70)^{o}C
Storage temperature:	(-20 to +70)^{o}C
Relative air humidity:	Maximum, 95% non-condensing
EMC - Immunity Interference:	EN61000-4-2
Weight:	1.7 oz.
Dimensions (inches) W x H x L:	0.72 x 2.68 x 3.26
Connection type:	RJ45 modular (auto-detecting transmit and receive)

Default Configuration

The PXM 2000 Series automatically recognizes the installed option card during Power Up. If you have not programmed a configuration for the card, the unit will default to the following:

IP Address: 192.168.1.1
Subnet Mask: 255.255.255.0
Default Gateway: 0.0.0.0

Wiring Diagram

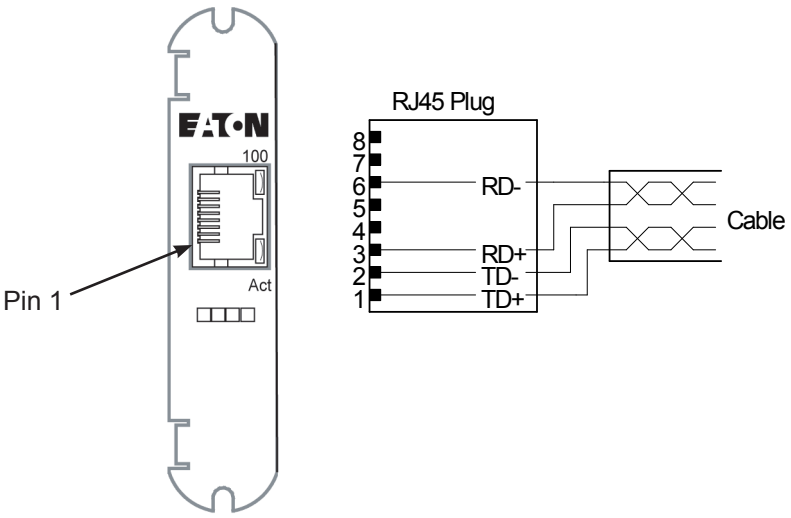


Fig. 7.7: PXM 2000 Gateway Card

IMPORTANT! The PXM 2000 Gateway Card uses an auto-detecting circuit that automatically switches the transmit and receive in order to properly align communication. Because of this, when you are communicating directly to a meter with a PC or a switch, a straight cable can be used.

Using the PXM 2000 Gateway Card

With the installation of the Power Xpert® Meter 2000 Gateway Card, you gain the capability of communicating over the Ethernet medium using EATON's Power Xpert architecture.

Hardware Connection

1. The Gateway Card comes pre-installed in Slot #2 of the PXM Series meter. Refer to instructions at the beginning of this chapter for card installation.

2. Use a CAT 5 or better cable to connect to the Gateway Card.

The card auto-detects cable type and will work with either straight or crossover cable.

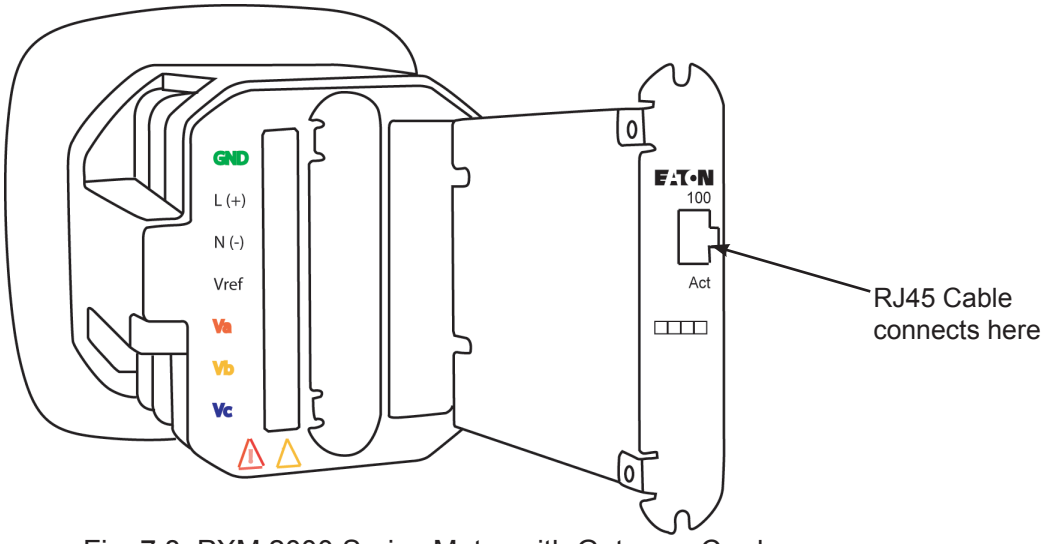


Fig. 7.8: PXM 2000 Series Meter with Gateway Card

Performing Network Configuration

As with the other Option cards, the PXM 2000 auto-detects the presence of the Gateway card. You configure the Gateway card through the Ethernet connection, using the Power Xpert webpage. See Chapter 10 for instructions.

8 INTRODUCTION TO WEB SERVER PAGES

This chapter is an introduction to the Power Xpert Meter web server pages and describes how to access basic information through them. Each option provides easy access to basic metering functions as well as setup configuration. Other information, such as waveforms, trending graphs, harmonic tables, and phasors are also available.

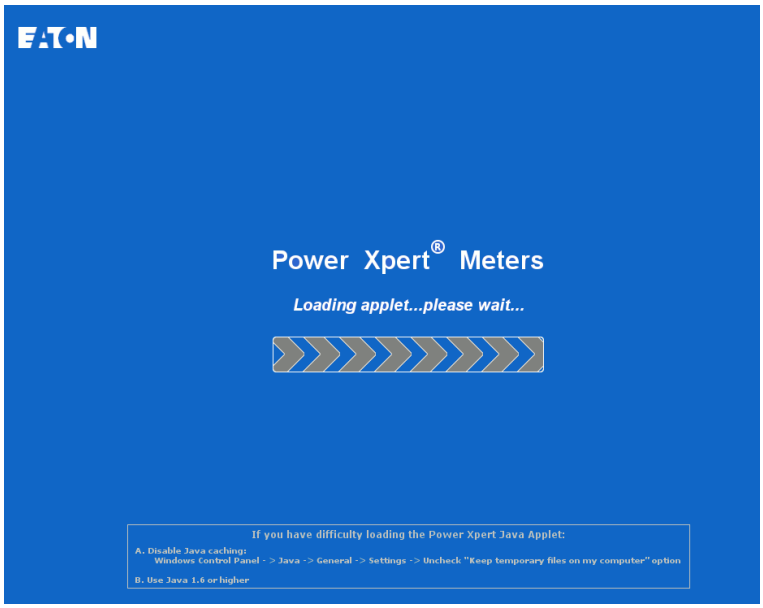
The *Functions on the Web Server Pages* chapter provides more detailed information about the functions, features, and options available on each page in the meter's web interface.

Accessing the Web Pages

You can access the Power Xpert Meter's built-in web site from Microsoft Internet Explorer version 6 or 7. On your client machine, you'll also need the Java J2SE Java Runtime Environment (JRE), version 6 or newer. The web pages use a Java applet and you must have a local copy of Java for this to work.

To access the meter's web site, simply enter the meter's IP address as the URL. You should see something similar to the following page.

Loading Page


Power Xpert® Meters
Loading applet...please wait...
If you have difficulty loading the Power Xpert Java Applet:
A. Disable Java caching:
Windows Control Panel -> Java -> General -> Settings -> Uncheck "Keep temporary files on my computer" option
B. Use Java 1.6 or higher

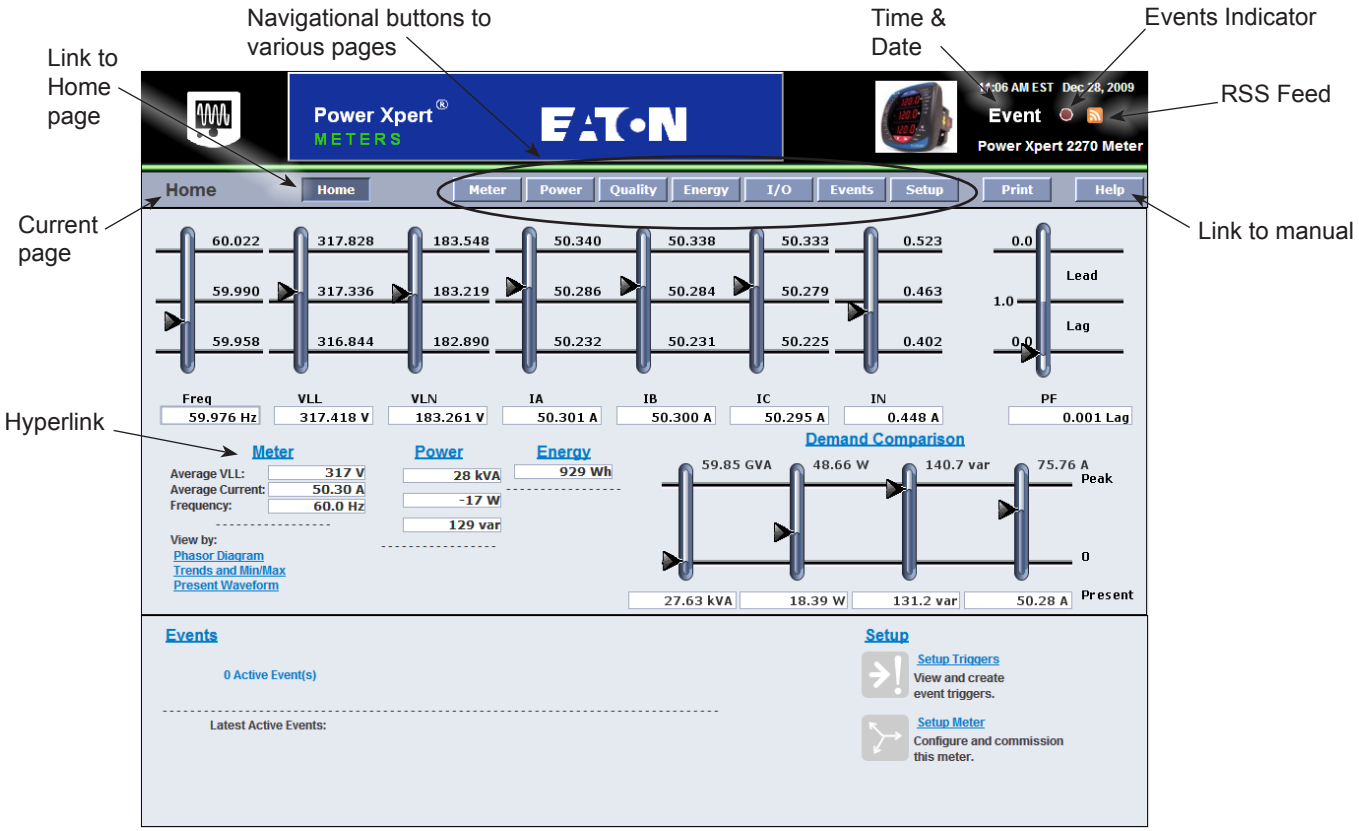
If you see a blank white or blue page and you don't see a "site unavailable" message, the likely cause is that you either don't have Java installed or that it isn't active. Check the Java console in the Windows Control Panel.

Home Page (Default)

The **Home** page displays an overview of the most pertinent current meter readings. From this page you can navigate to the **Meter**, **Power**, **Quality**, **I/O**, **Energy**, **Events** and **Setup** pages. The navigational buttons are in a row at the top of the screen.

Each section of the **Home** page also provides the hypertext links that also lead to more detailed information on the relevant page. For example, in the **Setup** section of the **Home** page below, the phrases **Setup Triggers** and **Setup Meter** are hyperlinks.

Meter Main Page Controls and Indicators



Common Controls for Selecting Information

The user interface of the **Meter** page shares many features with the **Power**, **Quality**, and **Energy** pages. These pages provide drop-down menus and radio buttons to select the information to be viewed and options for viewing it. For example, in the **Meter** page the left-side drop-down menu selects how voltage is viewed: **Line-Line** or **Line-Neutral**. The radio buttons select the voltage information to view: **Average**, **AB**, **BC**, or **CA**.

If more than one type of graph is available on the page, another drop-down menu in the

top center of the page provides options for selecting available graphs. For example, in the **Meter** page you can select from the following types of graphs:

- **Trend and Min/Max**
- **Waveform** (available in the 2270 model only)
- **Indvidual Harmonics** (available in the 2270 model only)
- **Phasors** (not a selection item if wiring configuration is set to Delta)

Note that trend data must be available for that time period in order to view the single-cycle **Waveform** graph of harmonic distortion. If the required data isn't available for the selected time period, you'll see an error message.

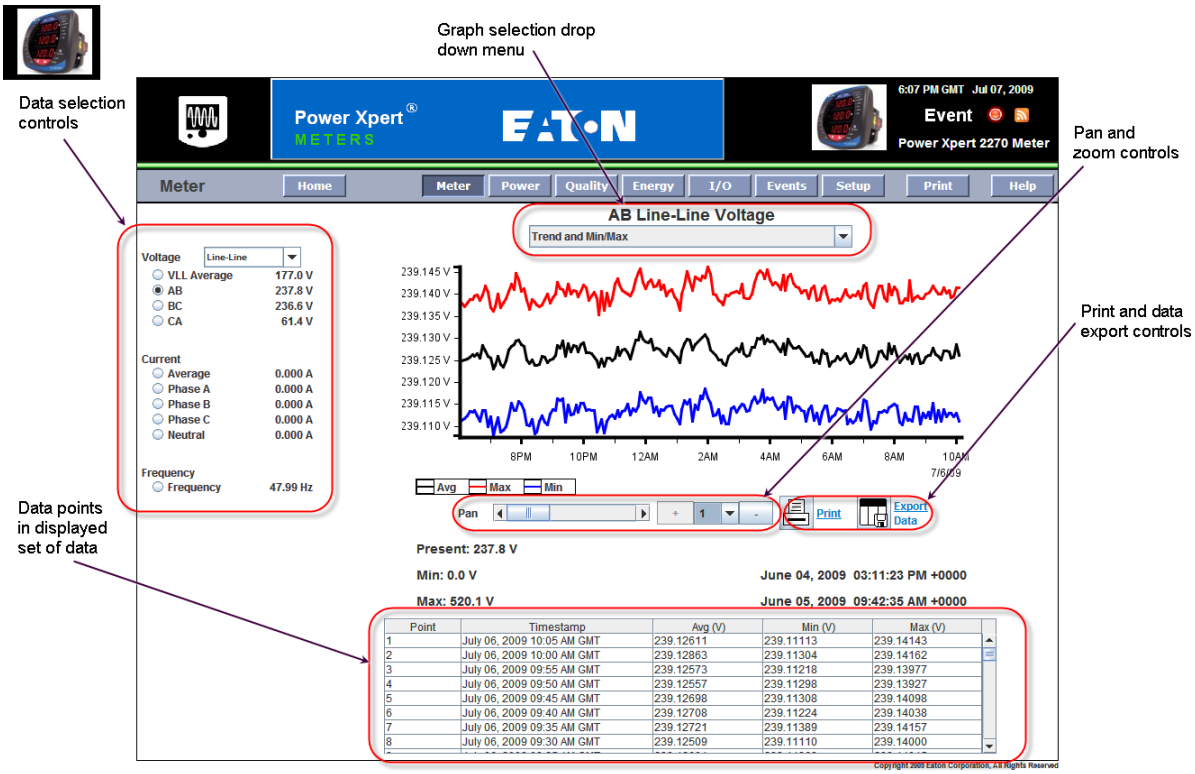
The Trend graph is a "snapshot" of the current values plus the historical values in the designated range (zoom). It doesn't update automatically and you must therefore re-select the information to update the the display.

You can pan or zoom through a graph by clicking one of the options below the graph. Use the pan feature to move forward or backward through the available time range. The zoom feature (plus, minus, and drop-down menu) provides the following time ranges:

- 1 - 16 hours
- 2 - Two days
- 3 - Eight days
- 4 - Four-and-a-Half Weeks (Demand Profile and Demand Comparison)

A table containing all of the plotted data points is beneath the plot. You can scroll through this to view individual data points.

The Meter Page



Printing and Exporting Information

Most pages have both **Print** and **Export Data** controls. The **Print** control outputs the current graph to the selected printer. The **Export Data** function will save the set of data to either a comma-separated values (CSV) file or will display the information in your default .csv file viewer (such as Microsoft Excel). You can select intervals of 5, 10, or 15 minutes and specify the beginning and ending dates for the data set.

Events Page

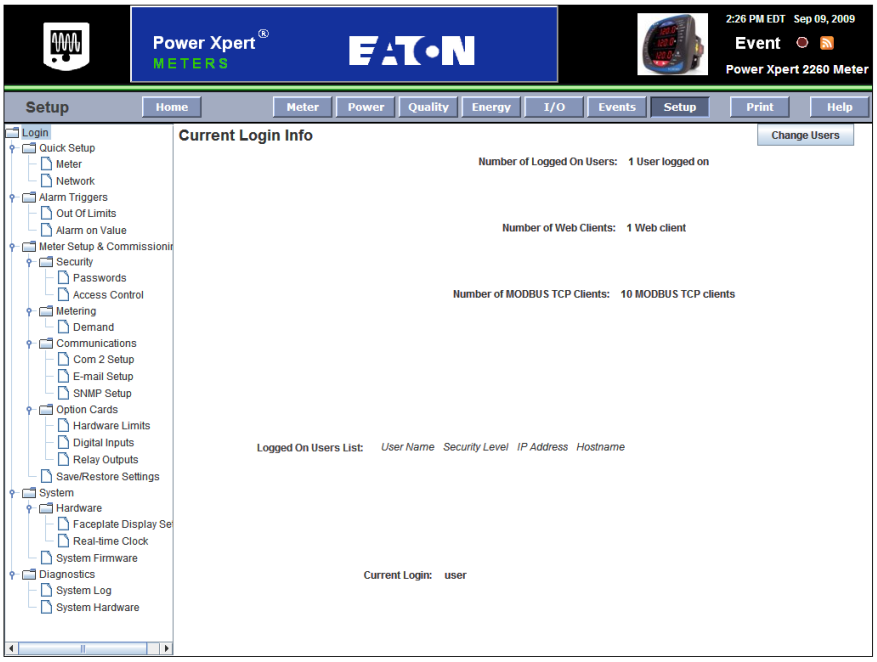
The top of the screen lists events within the event log and the bottom lists details about the currently selected event. The drop-down menu near the top of the page allows you to choose between currently active events and all events. You can also acknowledge and close events from this page (this requires the administrative account name and password).

Events Page

Setup Page

The **Setup** page is the administrative interface for the meter. Use this to initially configure the meter for operation as well as to fine-tune the configuration to meet your needs. You'll need the administrative account name and password to modify the setup parameters. Details about using the setup page are covered in the *Setup on the Web Pages* chapter.

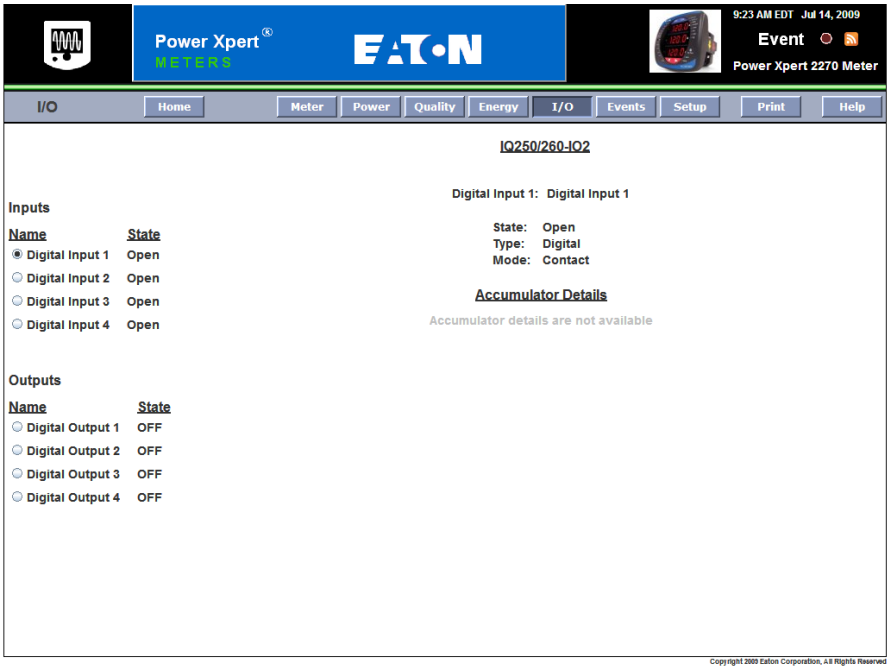
Setup Page



I/O Page

The I/O page shows the current status of all of the inputs and outputs from any installed I/O cards.

I/O Page

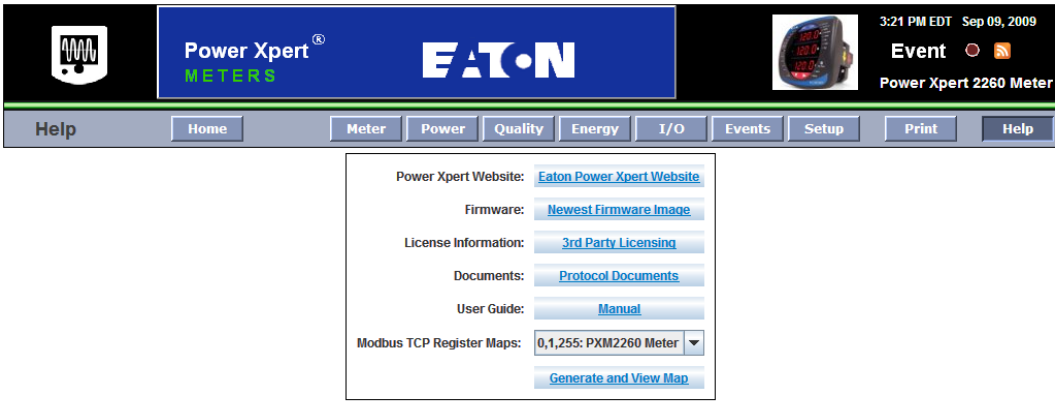


Help Page

The Help page not only provides access to the manual, but also lets you:

- Generate a map of the Modbus registers for both the meter and installed I/O cards.
- Access a web page from which you can download the various MIB files.
- Access the Eaton firmware update page.
- Access the Eaton Power Xpert Website.
- View licensing information for all 3rd party software used by the Gateway Card.

Help Page



9 FUNCTIONS ON THE WEB SERVER PAGES

Overview

The Power Xpert® Meter provides a detailed web interface, providing information for the following main functional categories:

- Home page (a summary of current values and navigation to other pages)
- Meter
- Power
- Quality
- Energy
- I/O
- Events
- Setup
- Help

This chapter is not an exhaustive resource, but rather the intent is to provide a general understanding of the information available on each of the meter pages.

Note: Setup information is not provided in this chapter. See *Setup on the Web Pages* in chapter 10 for setup details.

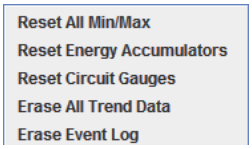
A General Note About Graphs and Plots

When you display a trend plot or other graph on the various meter pages, this is a “snapshot” showing the last values when the graph was displayed plus the historical data. To update with more current values, re-select the value that’s displayed in the list of radio buttons along the left of the page.

Home

The **Home** page provides a quick overview of the key current electrical values from the meter. It includes navigational links to each of the pages as well as to frequently used diagrams and graphs.

Meter



The **Meter** page provides **Voltage**, **Current**, and **Frequency** values. You can view information by measurement type or by phase. By right-clicking on this (or any measurement page), a drop-down list appears that you can use to reset data accumulation or clear logs, as shown to the left.

Voltage

The Power Xpert® Meter measures line-to-line and line-to-neutral voltages and calculates rms values over the period of one second. The system average values are calculated for main voltage channels.

The Power Xpert® Meter maintains a log of all voltage rms measurements date and time stamps. This information is also available as a trend graph. The min, max, and averages

are recorded for each interval. The following table shows the amount of data logged per Power Xpert Meter model:

Model	5-minute trends/ intervals	15-minute trends/ intervals	1-hour trends/ intervals
2250	90 days	1 year	5 years
2260	180 days	2 years	10 years
2270	1 year	3 years	15 years

All meter models also store 100,000 global event log entries and 1,000,000 global dead-band log entries.

The most recent minimum and maximum values are detected for all the voltage channels and are logged with date and time stamps. Current minimum and maximum values can be cleared by the user at any time through the right-click menu. After the current values are cleared, the meter will begin calculating new minimum and maximum values.

Locating Voltage Information

From the Meter page select **Line-Line** or **Line-Neutral** from the drop-down box beside Voltage on the left side of the page. Click one of the radio buttons below **Voltage** to select a specific voltage measurement (e.g.: **VLL Average**, **AB**, **BC**, **CA** for **Line-Line** or **VLN Average**, **AN**, **BN**, **CN** for **Line-Neutral**). The page will update to display the selection.

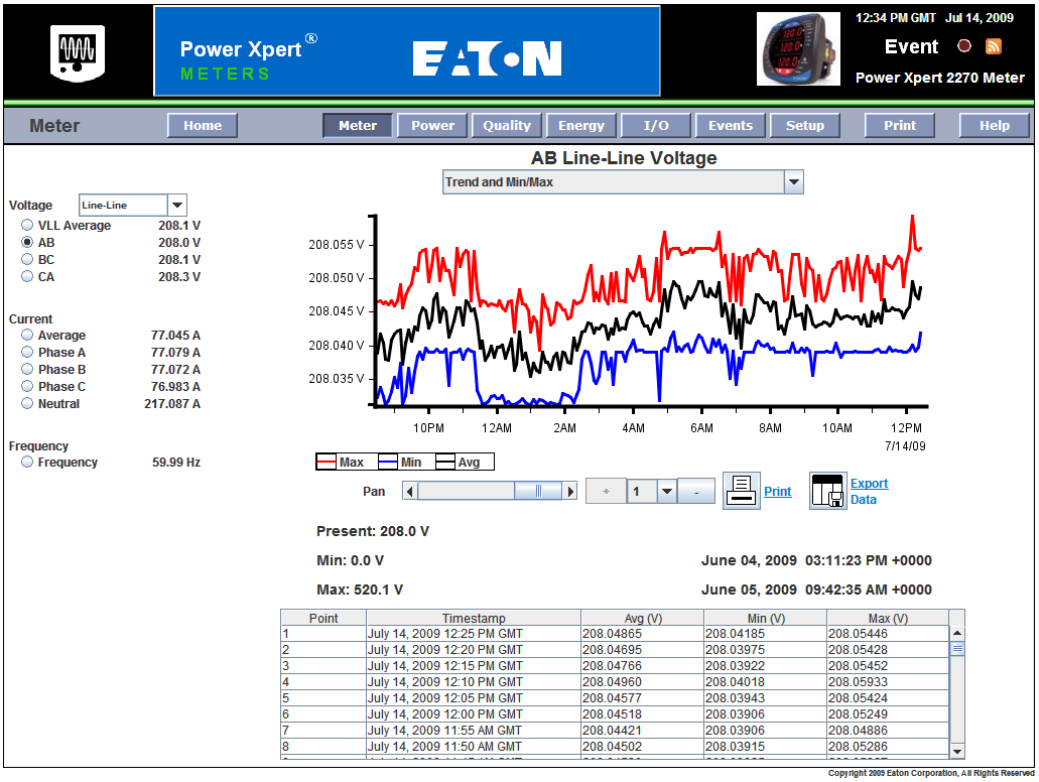
You can select trending, waveform, harmonics or phasor graphs from the drop-down box near the top of the page.

When **Trend and Min/Max** is selected, the minimum and maximum values are displayed with date and time stamps.

When **Harmonics** is selected, a table is displayed showing the **Frequency** (**Hz**), **Magnitude,** and **Angle (Deg)**. By default, the fundamental frequency is included. It can be excluded by selecting the **Exclude Fundamental** check box on the left side of the page.

NOTE: the **Waveform** and **Harmonics** views are only available on the PXM 2270 model.

Meter Page: Voltage Display

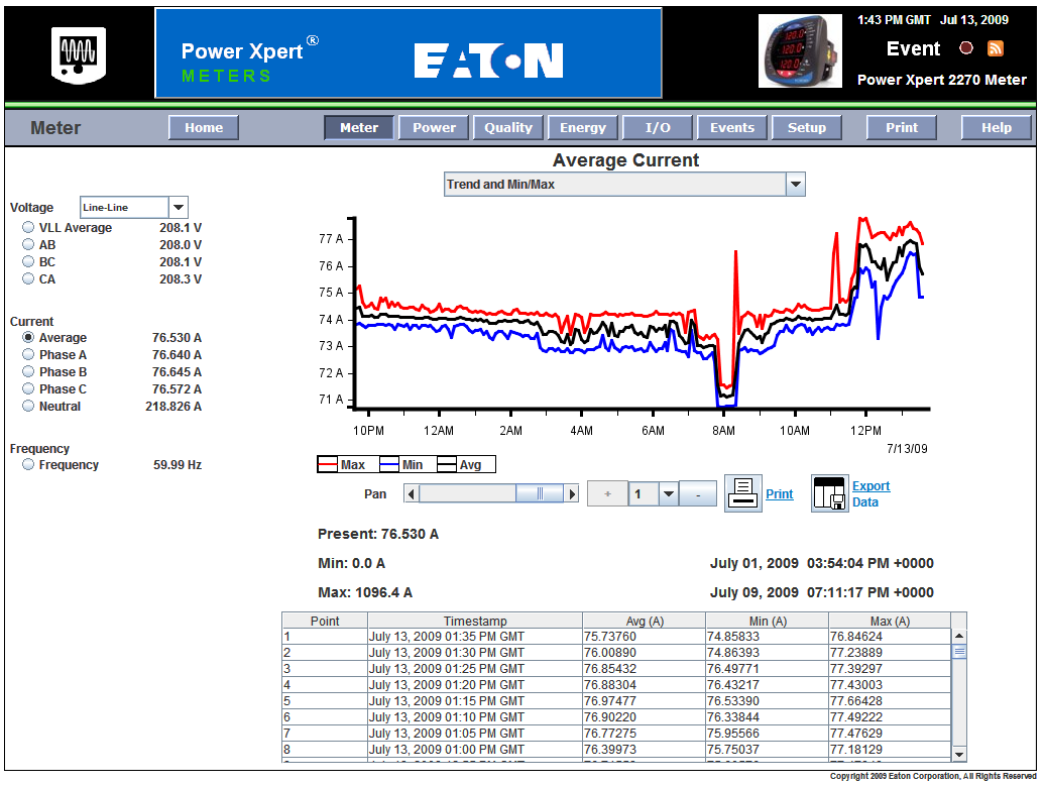


Current

The Power Xpert® Meter measures per phase and average system current and calculates rms values over the period of one second. The meter will maintain a log of all rms measurements with date and time stamps. The same information is available as a trend.

The most recent minimum and maximum values are detected for all the channels and are logged with date and time stamps. Current minimum and maximum values can be cleared by the user at any time. After the current values are cleared, the meter will start calculating new minimum and maximum values.

Meter Page: Current Display



Locating Current Information

From the **Meter** page, click one of the radio buttons listed below **Current** to select a specific phase or neutral. The page will update to display the selection.

To view the trending, waveform, harmonics, or phasor graphs, click the drop-down box located on the top of the page and make a selection.

When **Trend and Min/Max** is selected, the minimum and maximum values are displayed on the bottom, right side of the page with date and time stamps.

When **Harmonics** is selected, a table is displayed showing the **Order, Frequency, Magnitude, and Angle.** (PXM 2270 only).

By default, all the measurement options are selected when the **Phasor** diagram is selected. You can clear an option on the left side of the page to remove the correlating point of the phasor diagram.

Frequency

Frequency measurements for the meter occur every second using phase A voltage on V1. In the absence of voltage, there is no frequency measurement. The result is a gap in the trend data for frequency-dependent items. A trend of frequency measurements is maintained with date and time stamps. Minimum and maximum values are detected and saved with date and time stamps of the occurrence.

Locating Frequency Information

From the **Meter** page, click the **Frequency** radio button on the left side of the page.

To view the trending and phasor graphs, click the drop-down box at the top of the page

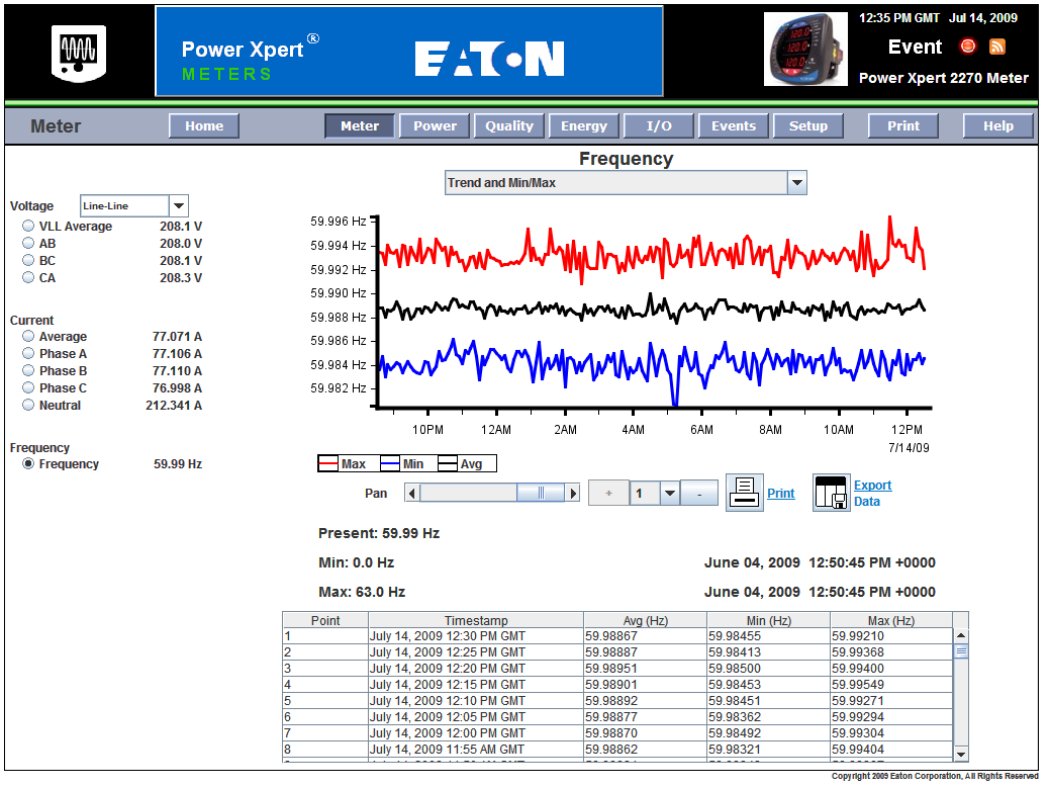
and make a selection. **Phasor** is not available if wiring configuration is set to **Delta**

When **Trend and Min/Max** is selected, the minimum, maximum, and average values are displayed on the bottom right side of the page with date and time stamps.

By default, all the options are selected when the **Phasor** diagram is selected. The user can unselect an option on the left side of the page to remove the correlating point of the phasor diagram.

Harmonics aren't available for frequency.

Meter Page: Frequency Display



Power

The **Power** page contains information about the present power consumption and power factor. The meter calculates the following :

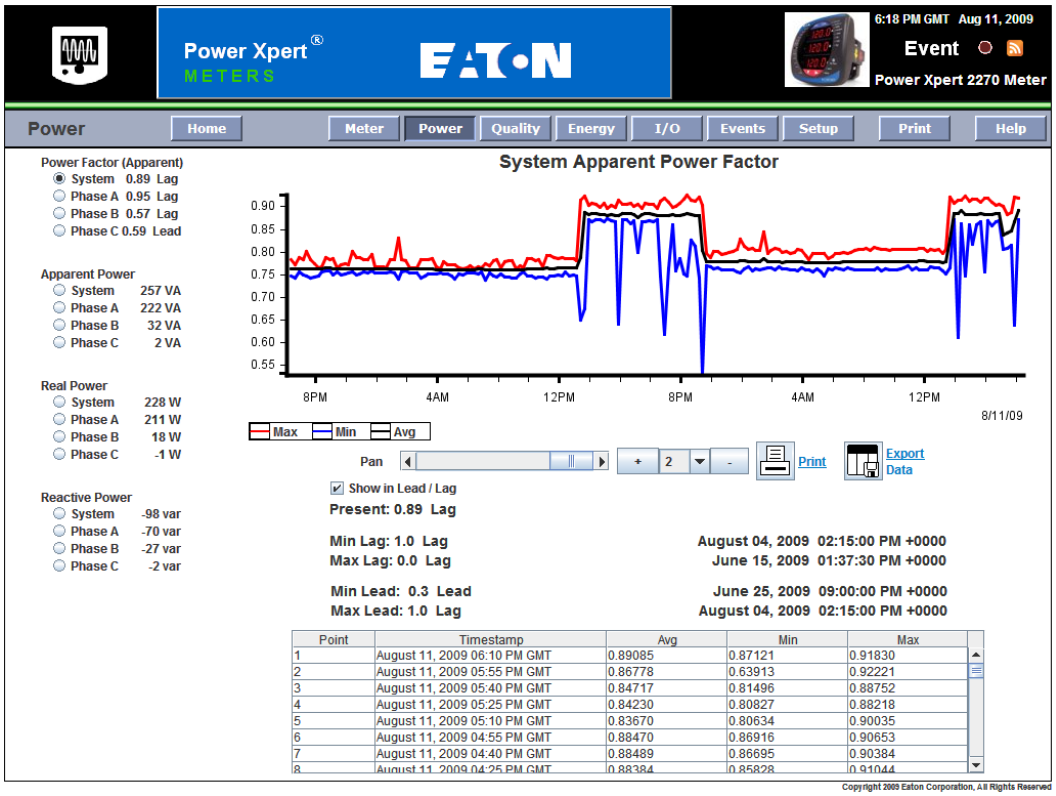
- Apparent Power Factor (PF) for System, Phase A, Phase B, and Phase C
- Apparent Power (kVA) for System, Phase A, Phase B and Phase C
- Real Power (kW) for System, Phase A, Phase B and Phase C
- Reactive Power (kvar) for System, Phase A, Phase B and Phase C

The meter will log the trend for all of the above measurements, as well as detect and save **Minimum** and **Maximum** values with date and time stamps for all of the above parameters.

Locating Power Information

From the **Power** page, click one of the radio buttons on the left side of the page that represents the type of power measurement you want to view. The page will update to display a graph with minimum, maximum and average values as per the selection.

Power Factor (Apparent)



Quality

The **Quality** page contains information about the present power quality for PXM2260 and 2270 meters. These meters calculate the following instantaneous values, averaged over a period of 60 cycles:

- Percent THD of Current for Phases A, B, and C
- Percent THD of Voltage for Phases A, B, and C.

Using the drop-down box above the graph, you can select to view this information as a trend, with minimum and maximum values, or as harmonics.

Note: The PXM2250 meter does not measure %THD.

THD

The Total Harmonic Distortion (THD) is the ratio, expressed as a percentage, of the rms value of the ac signal after the fundamental component is removed and inter-harmonic components are ignored to the rms value of the fundamental. The formula for THD is provided below. The variables X_1 and x_n may represent either voltage or current and may be expressed either as rms or peak values, as long as all are expressed in the same fashion.

$$D_x = \frac{\sqrt{\sum_{n=2} x_n^2}}{X_1} \cdot 100\%$$

$$\%THD\ x(t) = 100 * \sqrt{\{x_2^2 + x_3^2 + x_4^2 + \ldots x_n^2\}} / x_1$$

where n is the highest harmonic number used

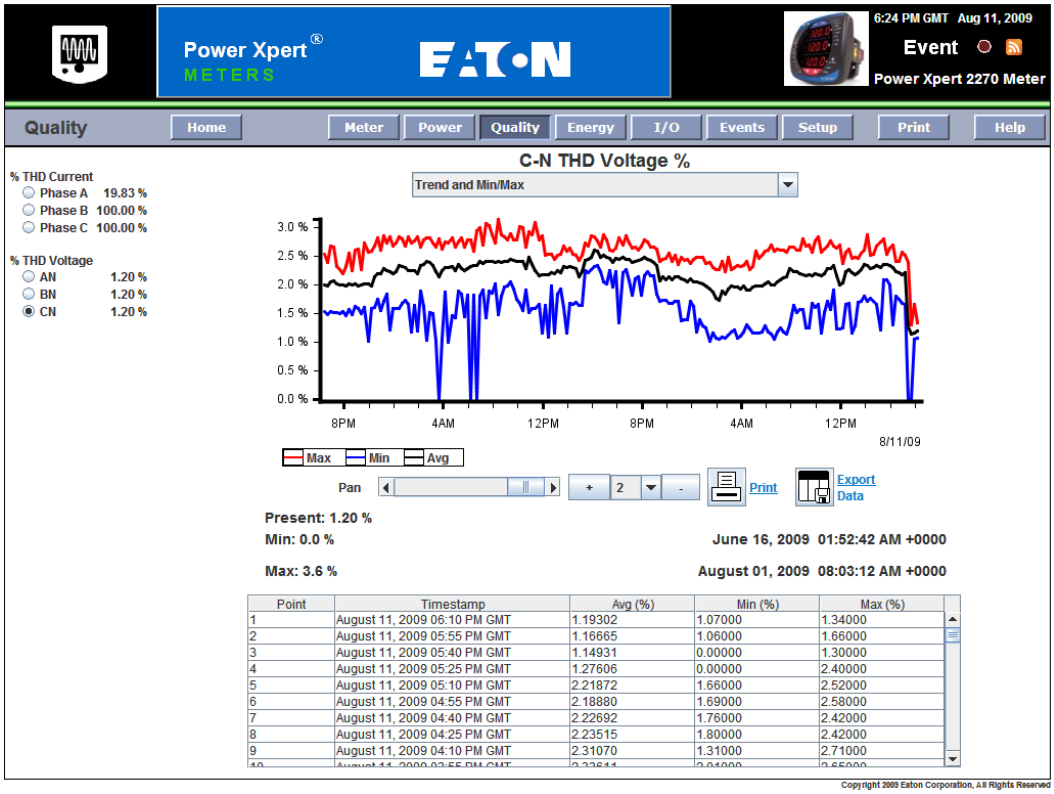
X_1 = fundamental value of current or voltage.

x_n = nth harmonic value of current or voltage.

Trend and Min/Max View

Like most other real-time measures, the **% THD Current** and **Voltage** measurements in the Power Xpert® Meter are trended and minimum and maximum values are logged with date and time stamps.

Trend View



Harmonics View

(PXM2270 only) The individual harmonics of the THD may be viewed for up to 40 harmonics of the fundamental frequency. Select this view from the upper-center drop down list.

Harmonics Plot

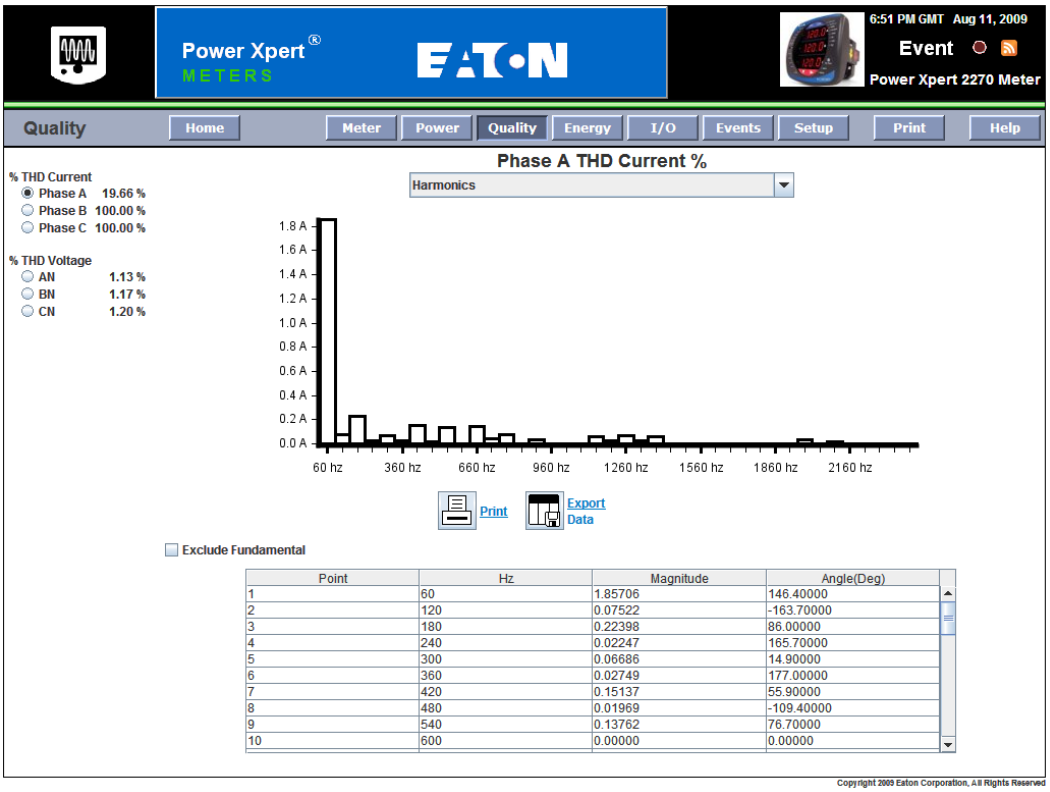


Table of Data Points

For both views, a table below the graph provides the numeric values as well. This table can be saved as a CSV file.

Energy

The Power Xpert Meter measures and accumulates three kinds of energy values every 60 cycles: Real Power (Watts), Reactive Power (VAR) and Apparent Power (VA). Real Power and Reactive Power take direction into account, and so are recorded for forward, reverse, net and sum.

These measurements are used to calculate accumulators for the kWh Forward/Reverse, Net and Sum: kVARh, Lag/Lead, Net and Sum, and kVAh.

- Real Power (Watts)
- Reactive Power (VAR) is the product of the voltage, the current, and the sine of the phase angle between them.
- Apparent Power (VA) is the square root of the sum of the squares of the active and reactive powers.

Demand

Demand is the power consumption at the receiving terminal averaged over a specific interval of time. The Power Xpert Meter is capable of measuring demand by two methods, fixed (**Block**) or sliding (**Rolling**), in intervals of 5 to 60 minutes. These measurements are performed for the Total Current, kW Forward/Reverse, Net and Sum; kVar Lead/Lag, Net and Sum and kVA.

Fixed and Sliding Demand

Fixed demand (**Total Current**), which is an average system current over time can be set to average current over a range of 5, 15, 30 or 60 minutes. This is known as a fixed window. For example, setting the current demand window to 15 sets the meter to determine the average current over the past 15 minutes and update the value every 15 minutes.

Power demand can be fixed, as described above, or sliding. For example, a 15 minute average can be obtained that is updated every 5 minutes. To accomplish this, the **Sub-interval** is set to 5 minutes and the **Total Interval** is set to 15.

Note: The **Total Interval** is the number of minutes in the average calculation. The subinterval is the number of minutes between updates.

The Power Xpert Meter starts the demand window on meter startup.

Demand Profile

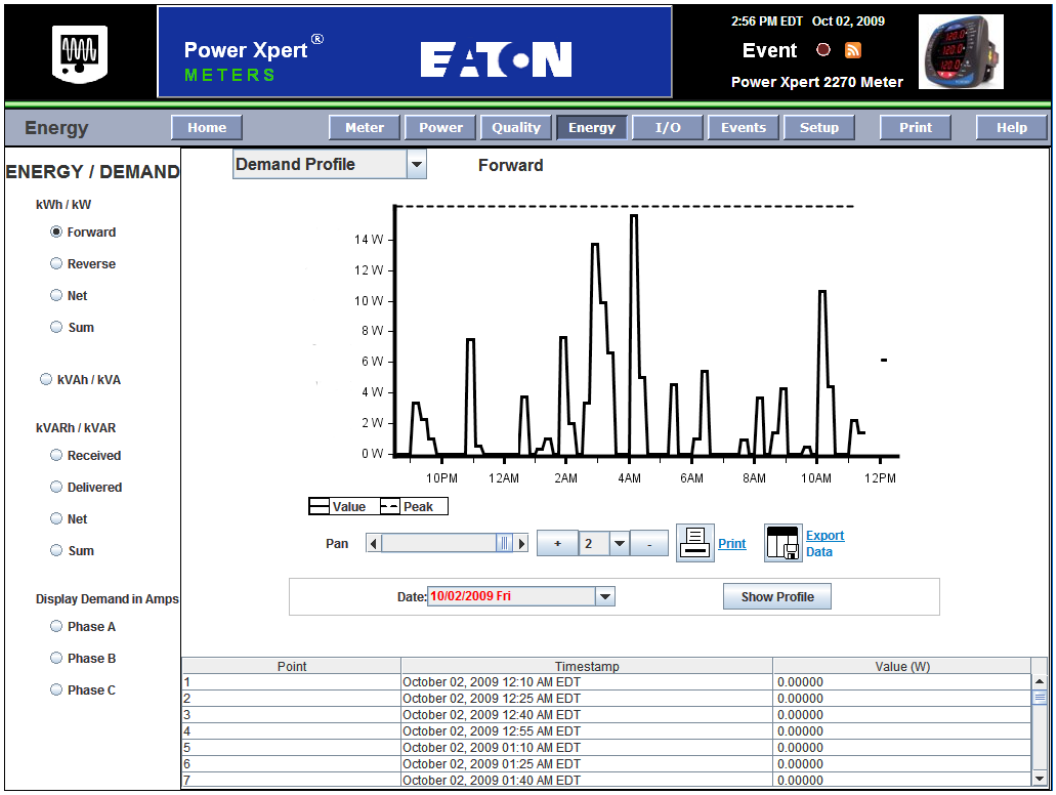
Demand Profile is the magnitude and duration of loads applied in a prescribed time sequence, including the transient and steady-state characteristics of the individual loads. The Power Xpert® Meter logs demand profile data from the following sources:

- kWh/kW: Forward, Reverse, Net, Sum,
- kVAh/kVA - kVARh/kVAR: Received, Delivered, Net, Sum, Total Current in Amperes, Phase Currents.

You can set the interval (in lengths of 5 to 60 minutes), sub-interval (used if **Sliding** is selected), and the demand type (**Fixed** or **Sliding**) in the **Demand** page under **Setup**. The interval duration for the monthly profile is 15 minutes, it is not user programmable.

For the **Demand Profile**, you can select a date from the drop down list and then click **Show Profile** to change the graph to reflect data from a different day.

Demand Profile



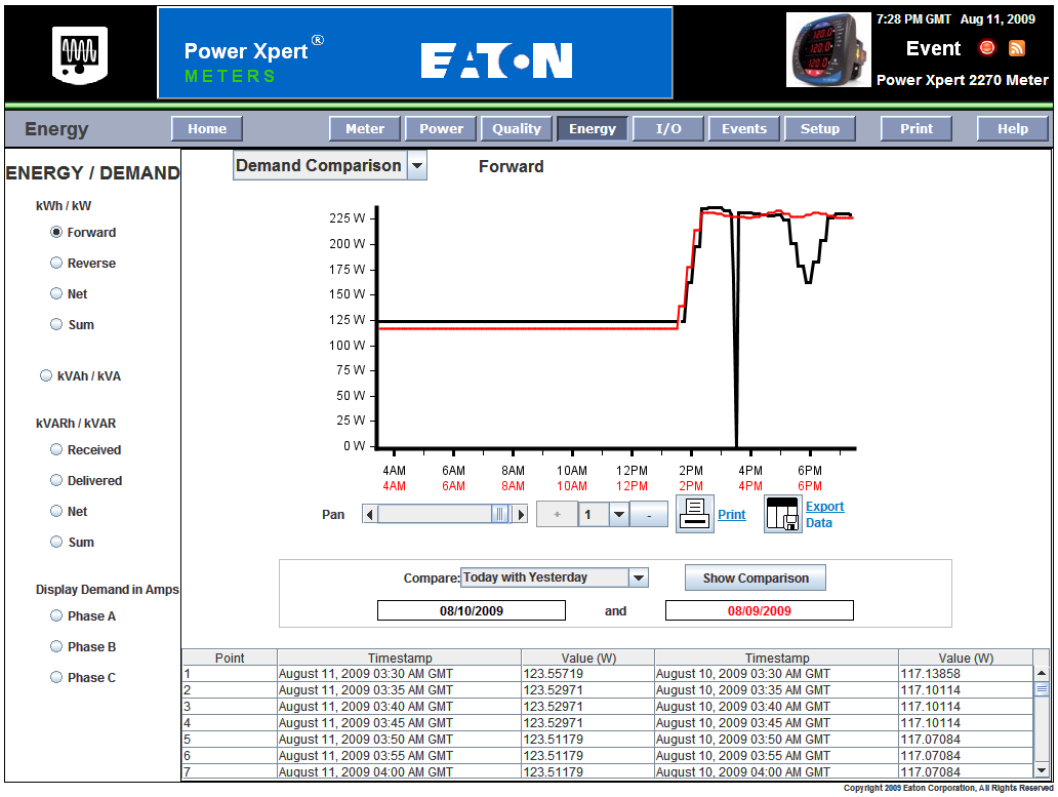
Demand Comparison

The **Demand Comparison** page is similar to the **Demand Profile** page, but provides a graph you can use to compare two overlaid demand plots from selectable periods of time. You can select to compare plots between:

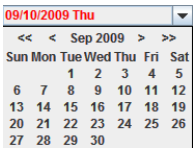
- Today and Yesterday
- This Week and Last Week
- This Month and Last Month
- 2 different Days
- 2 different Weeks
- 2 different Months

Peak demand is shown in the graph as a dashed line.

Demand Comparison Plot


Power Xpert®
METERS
EATON
7:28 PM GMT Aug 11, 2009
Event
Power Xpert 2270 Meter
Energy
Home
Meter
Power
Quality
Energy
I/O
Events
Setup
Print
Help
ENERGY / DEMAND
kWh / kW
Forward
Reverse
Net
Sum
kVAh / kVA
kVARh / kVAR
Received
Delivered
Net
Sum
Display Demand in Amps
Phase A
Phase B
Phase C
Demand Comparison
Forward
225 W
200 W
175 W
150 W
125 W
100 W
75 W
50 W
25 W
0 W
4AM 6AM 8AM 10AM 12PM 2PM 4PM 6PM
Pan
Print
Export Data
Compare: Today with Yesterday
Show Comparison
08/10/2009
and
08/09/2009
Point | Timestamp | Value (W) | Timestamp | Value (W)
1 | August 11, 2009 03:30 AM GMT | 123.55719 | August 10, 2009 03:30 AM GMT | 117.13858
2 | August 11, 2009 03:35 AM GMT | 123.52971 | August 10, 2009 03:35 AM GMT | 117.10114
3 | August 11, 2009 03:40 AM GMT | 123.52971 | August 10, 2009 03:40 AM GMT | 117.10114
4 | August 11, 2009 03:45 AM GMT | 123.52971 | August 10, 2009 03:45 AM GMT | 117.10114
5 | August 11, 2009 03:50 AM GMT | 123.51179 | August 10, 2009 03:50 AM GMT | 117.07084
6 | August 11, 2009 03:55 AM GMT | 123.51179 | August 10, 2009 03:55 AM GMT | 117.07084
7 | August 11, 2009 04:00 AM GMT | 123.51179 | August 10, 2009 04:00 AM GMT | 117.07084
Copyright 2009 Eaton Corporation, All Rights Reserved

Calendar Control



While viewing the **Demand Comparison** page, you can also select to compare the information to previous time periods: day-to-day (**Demand Comparison** only), week-to-week, or month-to-month. If you're comparing two specified time periods, such as two different days, a calendar control appears when you click either date. Click a day in the calendar to select the beginning and ending dates in the comparison. The < and > controls in the calendar move forward or backward one month. The << and >> controls move the calendar forward or backward one year.

Locating Demand and Energy Information

From the **Energy** page:

1. Click a radio button on the left side of the page that represents the kind of **Energy** and **Demand** you wish to view.
2. From the drop-down box near the top of the page, select either **Energy** and **Demand**, **Demand Profile**, or **Demand Comparison**.

The page will update to display the information selected.

The table shown below the graph shows each demand update value along with the time stamp. The contents of the table can be written to file formats that are compatible with various third-party spreadsheet, database, and data analysis tools. The **Export Data** button provides the option to write a comma separated values (`.csv`) file. The `.csv` file is written to the `My Documents` folder of your local computer. The first row in the file contains the column titles.

If you want to just copy a section of a table to paste into a report or email, simply select the information you want in the table and copy it to the Windows clipboard (Ctrl+C). Place the cursor where you wish to paste the information in the third-party application and press Ctrl+V. To select the entire table, press Ctrl+A

Events

The Power Xpert Meter monitors and logs **Out of Limits** and **Alarm on Value** events Events can be used to send e-mail as well as to change the state of internal or external I/Os.

Triggers

The following sections highlight available triggers. The meter will use the programmed limits set by the user. Every event and its corresponding parameters along with the date and time of the occurrence are logged and available for display or retrieval.

Triggers are configured in the **Setup** page. Each trigger can have the following limits:

- Upper Critical Limit
- Upper Cautionary Limit
- Lower Cautionary Limit
- Lower Critical Limit

In addition, you can select:

- If alarms are enabled for this data.
- If the limits simply trigger an event (not an alarm).
- If the alarm/event closes automatically when the value falls below the high limits or above the low limits. If not, a user must acknowledge the alarm to remove it from the active list.

In addition, alarms and events will generate an RSS feed and can generate email and alerts. See the *Setup on the Web Pages* chapter for setup details for triggers, I/O, and E-mail.

Out of Limits

The Power Xpert® Meter monitors and logs **Out of Limit** events for the following triggers:

Ia	Demand Ia Peak	Ib
Demand Ib Peak	Ic	Demand Ic Peak
In	Iavg	Vab
Van	Vbc	Vbn
Vca	Vcn	V(L-L) Average
V(L-N) Average	Avg. Negative PF	Avg Positive PF
Demand Current (3 Phase Avg)	Demand Forward Watts	Demand Ia
Demand Ib	Demand Ic	Demand In
Demand In Peak	Demand Lagging VARs	Demand Leading VARs
Demand Net VARs	Demand Net Watts	Demand Reverse Watts
Demand Sum VARs	Demand Sum Watts	Demand VAs
Frequency	Percent THD Ib	Percent THD Ic
PF App Phase A	PF App Phase B	PF App Phase C
PF Apparent	Peak Demand Amps Avg	Peak Demand Forward Watts
Peak Demand Lagging VARs	Peak Demand Leading VARs	Peak Demand Net VARs

Peak Demand Net Watts	Peak Demand Reverse Watts	Peak Demand Sum VARs
Peak Demand Sum Watts	Peak Demand VAs	Phase Angle Ia
Phase Angle Ib	Phase Angle Ic	Phase Angle Vab
Phase Angle Vbc	Phase Angle Vca	Apparent Power Phase A
Apparent Power Phase B	Apparent Power Phase C	Reactive Power
Apparent Power	Percent THD Van	Reactive Power Phase A
Reactive Power Phase B	Reactive Power Phase C	Percent THD Vbn
Percent THD Vcn	Real Power Phase A	Real Power Phase B
Real Power Phase C	Real Power	

In addition, some of the I/O cards have hardware out of limits. Refer to chapter 10, *Setup on the Web Server Pages* for more information.

Alarm on Value

The meter can issue alarms based on the value of a digital input from an option card, if a Modbus/RTU device experiences a communications failure, or if a meter restart is pending.

Locating Events

From the **Events** page, you can view either currently active events or a log of all events that have occurred. Click a specific event in the list to display the detailed information about that event at the bottom of the page. You can acknowledge or clear either the currently selected event or all events.

Events Page

Power Xpert®
METERS
EATON
6:37 PM GMT Jul 07, 2009
Event
Power Xpert 2270 Meter
Events
Home
Meter
Power
Quality
Energy
I/O
Events
Setup
Print
Help
Active Events
228152 Critical - High Avg Volts L-L 2009-07-07 16:28:25
Ack
Clear Event
Export Data
View Data
Ack All
Clear All Events
Event Details
Event ID: 228152
Sequence Index: 0
Trigger Type: Out of Limits
Time: 2009-07-07 16:28:25 UTC
Description: Critical - High Avg Volts L-L
Value: 194.125
Acknowledgment Status: Not Acknowledged
Condition Present: true
Note:
Copyright 2009 Eaton Corporation, All Rights Reserved

10 SETUP ON THE WEB SERVER PAGES

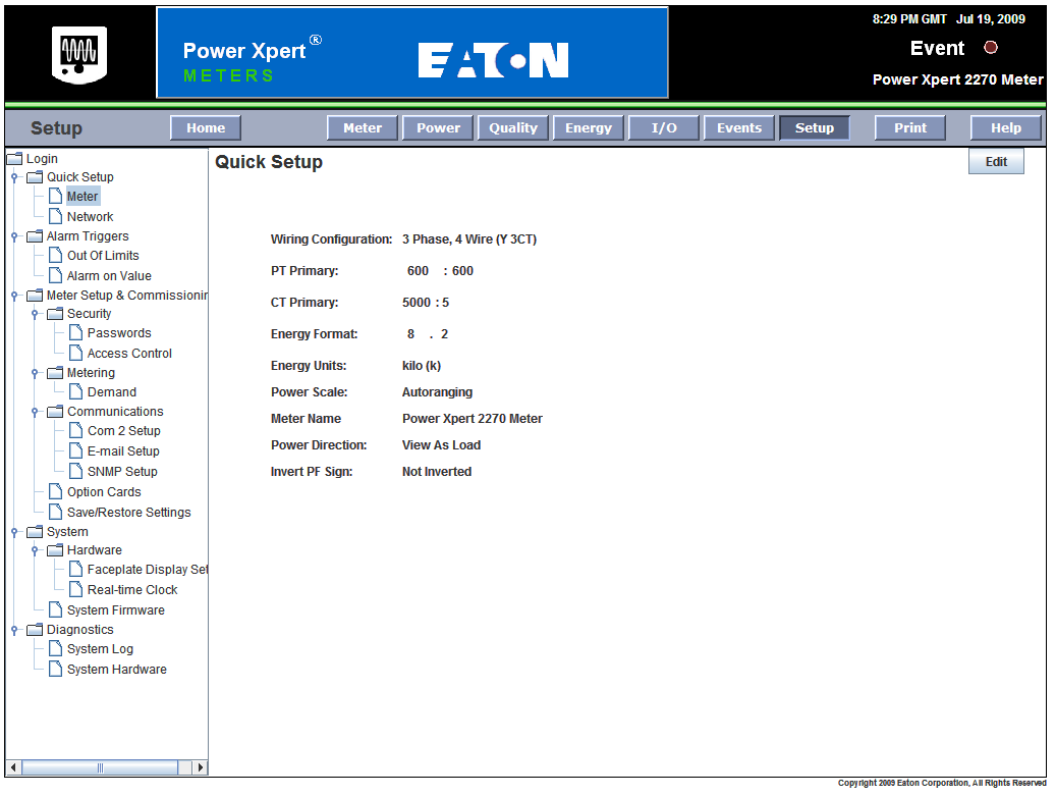
Overview

This section provides information about setup, including the settings that are currently active and how to change settings in specific categories.

Setup Page

When the **Setup** page opens, a collapsed tree structure is displayed on the left side of the page. Clicking topics within the structure will expand the list to include all the pages available for viewing or configuration. Click one of the options to view detailed information about the selection, as displayed below. The information will be displayed in the midsection of the page.

Typical Setup Page



Note: All configuration (edit) abilities discussed in the following sections require you to login with the **admin** account.

Login

The Login page provides information about the number of logged in users, web clients, and MODBUS TCP clients. Users are identified by name, security level. IP address, and hostname. You can also either logout from this page or log in as a different user.

Login Page

Quick Setup - Meter

The **Quick Setup - Meter** page provides quick access to the most common configuration settings.

The **Quick Setup - Meter** page provides access to:

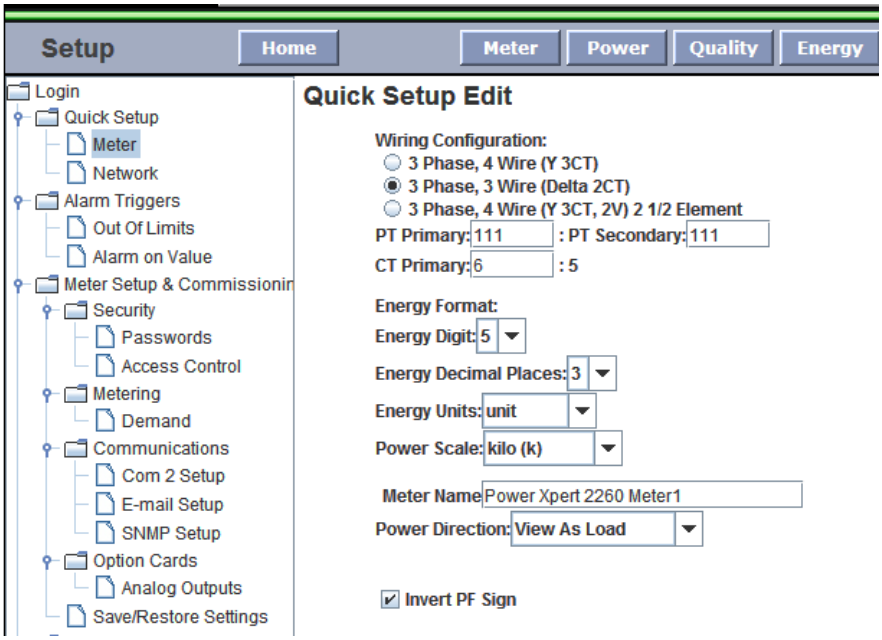
- The **Wiring Configuration** selection
- Potential Transformer (PT) Ratio and the Current Transformer (CT Ratio)
- Energy units display format and the meter name

Select one of the following wiring configurations based on the installation:

- 3 Phase, 4 wire (Y 3CT)
- 3 Phase, 3 wire (Delta 2CT)
- 3 Phase, 4 wire (Y 3 CT, 2V) 2 1/2 Element. (This configuration is **not** recommended. In this configuration the B phase voltage is not measured to save the cost of a B Phase voltage transformer. A balanced 3 phase voltage is assumed to estimate B phase voltage for the purpose of 3 phase power and energy estimation (does not comply with Blondel's theory). 2.5 element Wye configuration cannot detect problems with B phase voltage. The Phase AB and BC voltage values shown on the Meter web page are estimates only, and on the Power web page only the System values will be shown. Phase A, B, and C values will display as zero.)

Note: Wiring configurations are detailed in chapter 4, *Electrical Installation*.

Quick Setup Page - Meter



Quick Setup - Network

The **Ethernet/LAN Setup Edit** page provides all of the TCP/IP communications settings. You have two choices for configuring the meter:

- Fixed (static) IP address
- DHCP which resolves to a fixed IP address

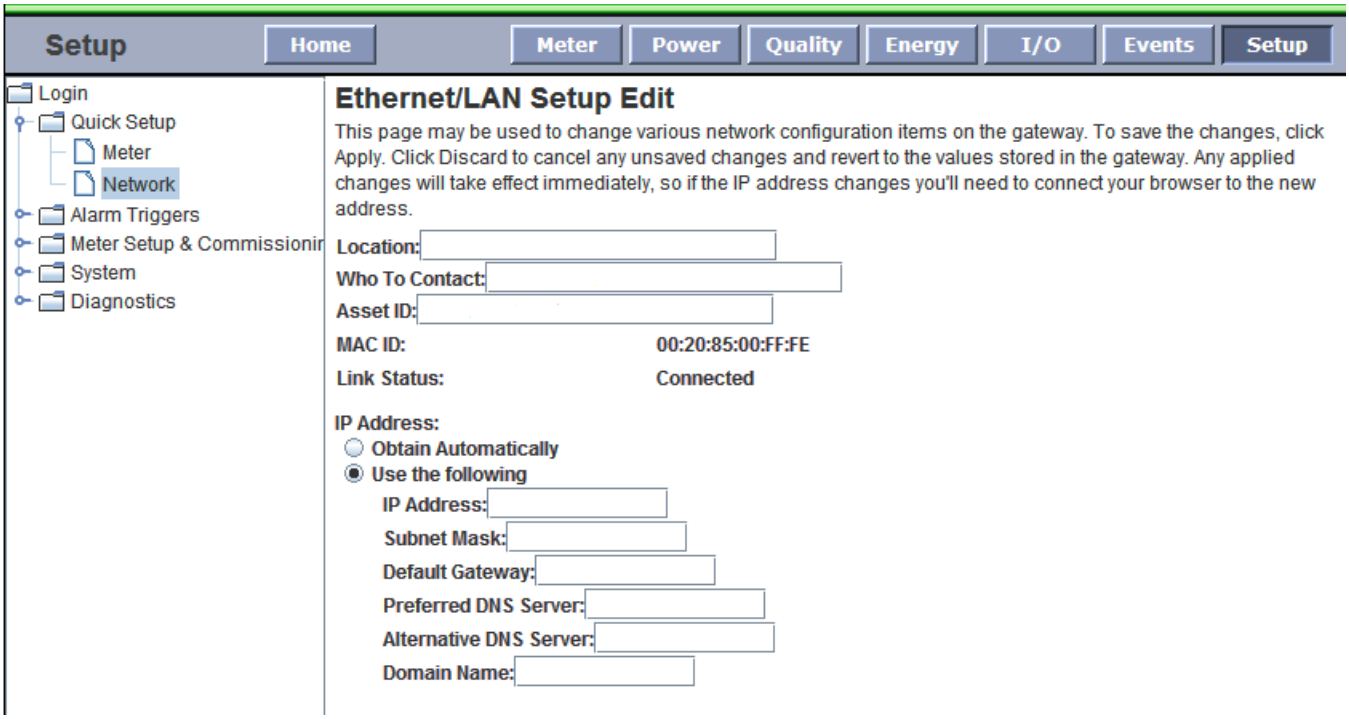
Eaton does not recommend using a DHCP setup that can randomly assign an IP address from a pool of possible addresses. Rather, if you use DHCP you should use a scheme wherein the router or layer 3 switch assigns a fixed IP based on the MAC address of the meter. Thus, at every reboot or power-up, the meter will always be granted the same IP address. This method is sometimes called “static DHCP.”

Eaton recommends using a method that assigns a fixed IP address for two reasons:

- Software that may connect to and monitor the meter, such as Power Xpert Software, accesses the meter via its IP address, and therefore if the meter losses power and receives a new IP address on power-up, the connection from the software to the meter will be broken.
- Users will also generally navigate to the meter’s web pages via the meter’s IP address. If the meter is assigned a different IP on power-up or reboot via DHCP, users won’t know the new address and won’t be able to access the meter.

Note: After you’ve assigned an IP address, it is visible from the front panel via the IP menu.

Ethernet/LAN Setup Edit



In addition to network settings, you can also add location, contact, and asset ID information.

Alarm Triggers

The meter has two types of triggers:

- **Out of Limits** triggers provide set points for issuing alarms for any of the supported electrical measurements. You can also set a hysteresis value for these to avoid rapid, multiple trips from a value that hovers around the set point.
- **Alarm on Value** has a set of core reset or communications parameters and may include additional communication or reset parameters from option cards. These parameters reflect device status and not electrical measurements.

Alarm Triggers - Out of Limits

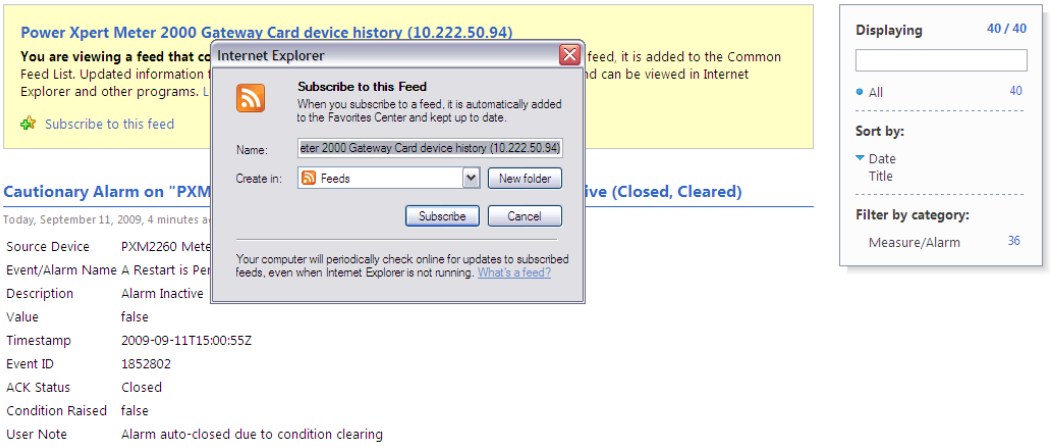
You can use the **Out of Limits Triggers** page to set hi and low cautionary and critical alarms for a wide range of electrical parameters (see page 9-12 for a complete list of parameters). For a detailed discussion of triggers, see page 9-12. Triggers can cause the following actions:

- An event is added to the event log, and can be seen in the **Events** page.
- The event indicator at the top of each meter page flashes.
- The event information is sent via SNMP as a trap. SNMP is a standard protocol used to monitor and manage devices on a network. The trap protocol allows a node (such as the meter) to send a message to SNMP monitoring/management software without being queried.
- The event information is sent as an RSS (Atom) feed. You can subscribe to the meter's Atom feed by clicking the RSS icon at the top, right side of the page. In the RSS

RSS Icon

feeds page that appears click the **Subscribe to this feed** link. In the dialog box that appears, click the **Subscribe** button.

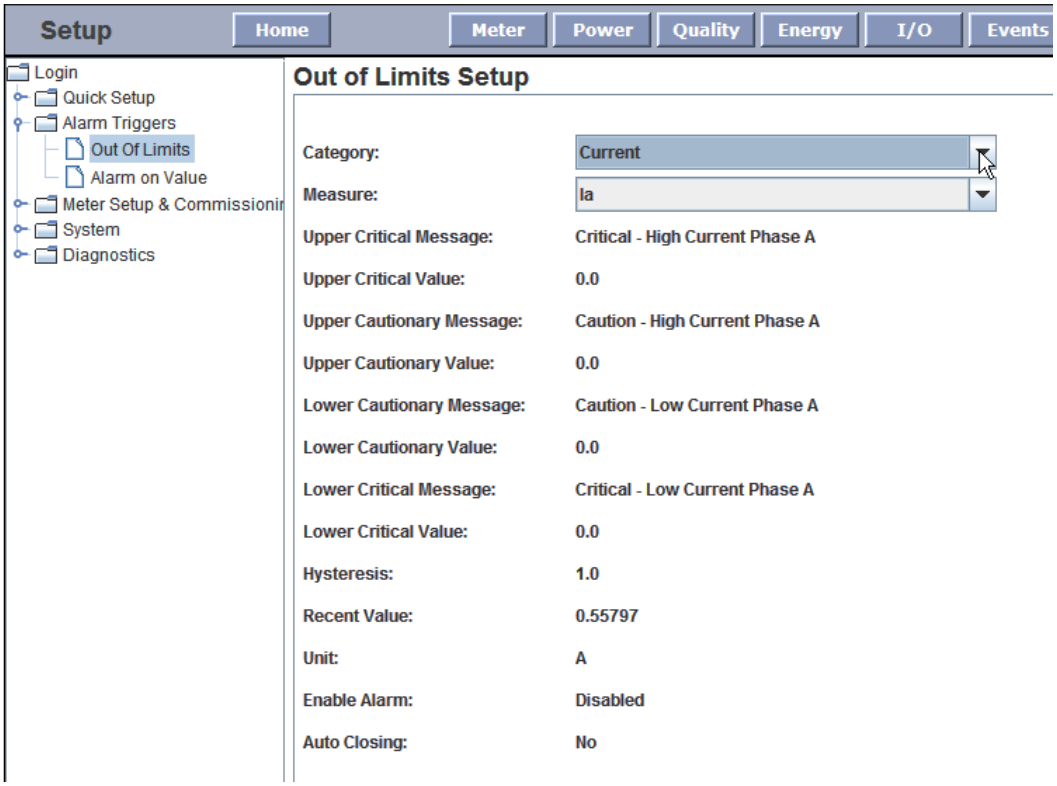
RSS Feeds Page, Showing Subscription Dialog Box


Power Xpert Meter 2000 Gateway Card device history (10.222.50.94)
Internet Explorer
Subscribe to this Feed
When you subscribe to a feed, it is automatically added to the Favorites Center and kept up to date.
Name:
Create in:
Feeds
New folder
Subscribe
Cancel
Your computer will periodically check online for updates to subscribed feeds, even when Internet Explorer is not running. What's a feed?
Subscribe to this feed
Displaying 40 / 40
All 40
Sort by:
Date
Title
Filter by category:
Measure/Alarm 36
Source Device PXM2260 Mete
Event/Alarm Name A Restart is Per
Description Alarm Inactive
Value false
Timestamp 2009-09-11T15:00:55Z
Event ID 1852802
ACK Status Closed
Condition Raised false
User Note Alarm auto-closed due to condition clearing

The RSS feed subscription appears in Internet Explorer 7 under **Favorites** in the Feeds tab. Each event is shown as an individual feed. Clicking a feed launches the RSS feeds page, from which you can view event details. Clicking an event on the RSS feeds page launches the meter's Home web page.

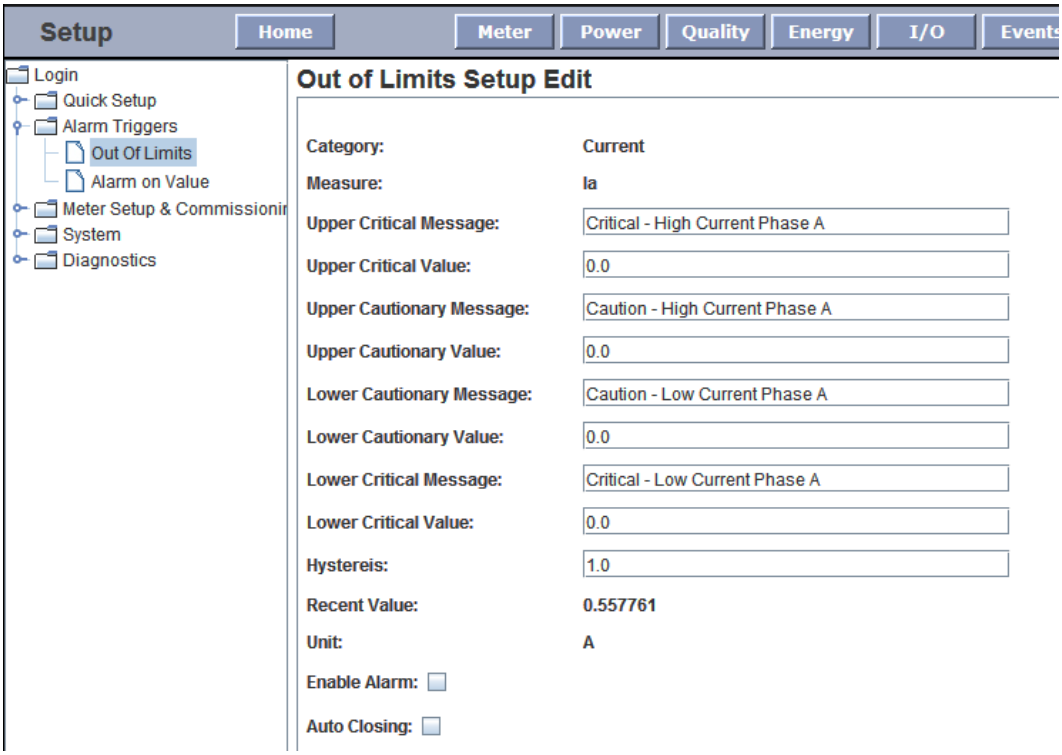
- The event information can be sent to one or more recipients as an email message.

The Out of Limits Triggers Page



In addition to setpoints and alarm messages, you can also set the hysteresis. This is set as a percentage, and is used to dampen “noise” events caused by a value bouncing back and forth across a set point.

Out of Limits Setup Edit Page

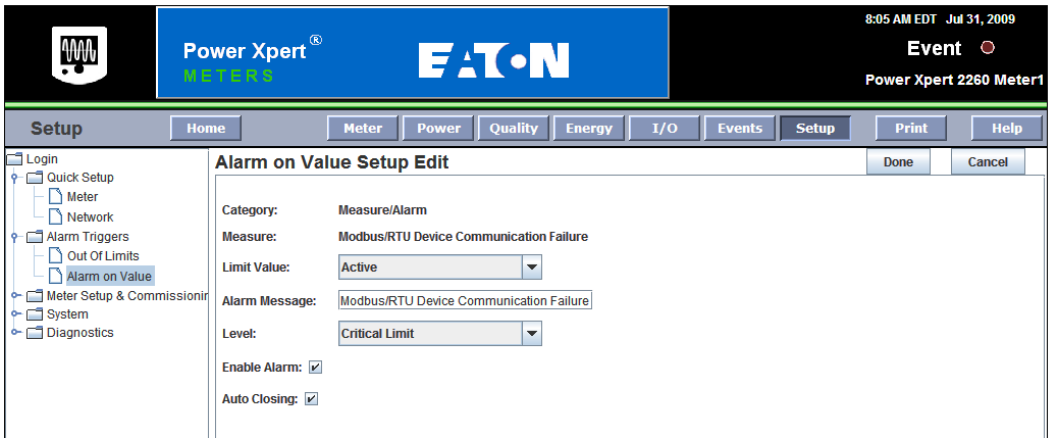


Alarm on Value

Use the **Alarm on Value Setup** page to configure device, option card, or communications status event triggers. You can configure if such events are to be treated as alarms, what the alarm levels are, the messages associated with the events, the limit values, and if the alarms are to be autoclosing. These alarms include:

- Restart is pending
- Modbus RTU communications failure
- Alarms based on the state of digital inputs.

Alarm on Value Setup Page



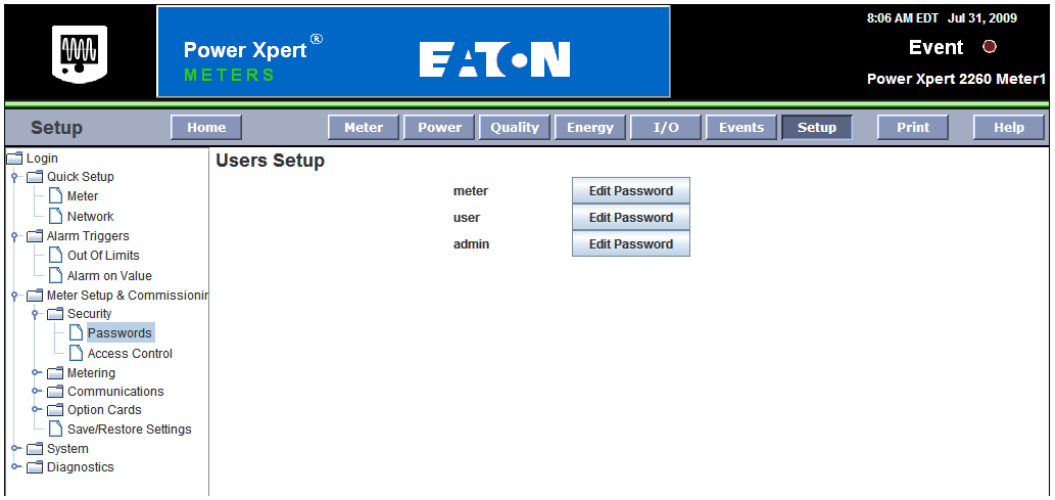
Meter Setup & Commissioning

Security Setup

The PXM 2000 meter has two built-in accounts and an additional password for access to data deletion functions from the meter front panel. You cannot change the name of any of the accounts, but you may change the password.

- The meter account provides access to configuration settings and resets from the meter front panel. This can be configured only from this page. This must be a four-digit password. The default is 5555, which disables the need for a password to change configuration settings or resets. Access to this password is only available with admin privileges.
- The user account is for access to the meter web pages only. Someone logged in as user cannot change any settings. The default password is user.
- Use the admin account to change settings or delete data. The default password is admin.

Passwords Page



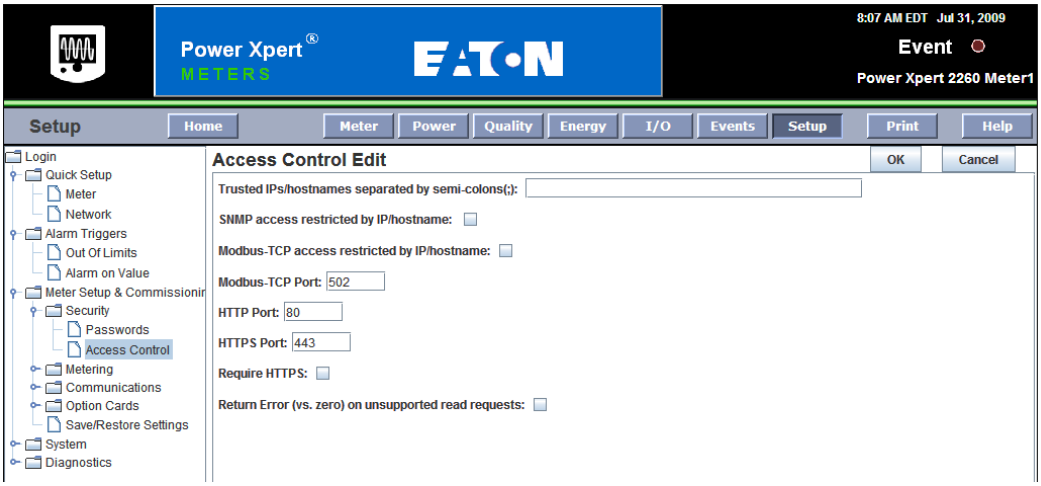
Security - Access Control

You can additionally limit access to the meter in the following ways:

- You can restrict either SNMP or Modbus access to the meter to a set of trusted IP addresses or hostnames. You can have separate sets of trusted machines for either setting.
- You can set the ports for Modbus, HTTP, or HTTPS.
- You can require the HTTPS for web access to the meter.

Finally, you can opt to return an error for unsupported read requests.

Access Control Edit Page

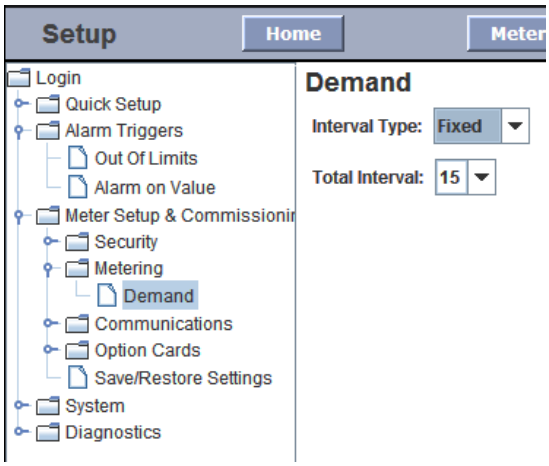


Metering - Demand

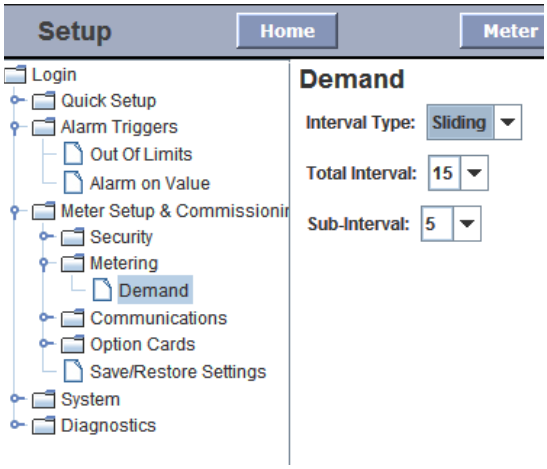
The **Demand Setup** page allows you to select either a fixed window or sliding window and the respective intervals in minutes. A fixed window setting allows you to select one interval period. For example, if 15 minutes is selected, the demand calculation will be performed and the demand values will be updated every 15 minutes.

With a sliding window setting, the Power Xpert Meter provides a rolling average; you select the interval period and the subinterval period. For example, if you select 15 minutes as the demand interval and 5 minutes as the subinterval, the demand will calculate every 5 minutes using the 3 subinterval values (15 = 5X3).

Fixed Settings



Sliding Settings



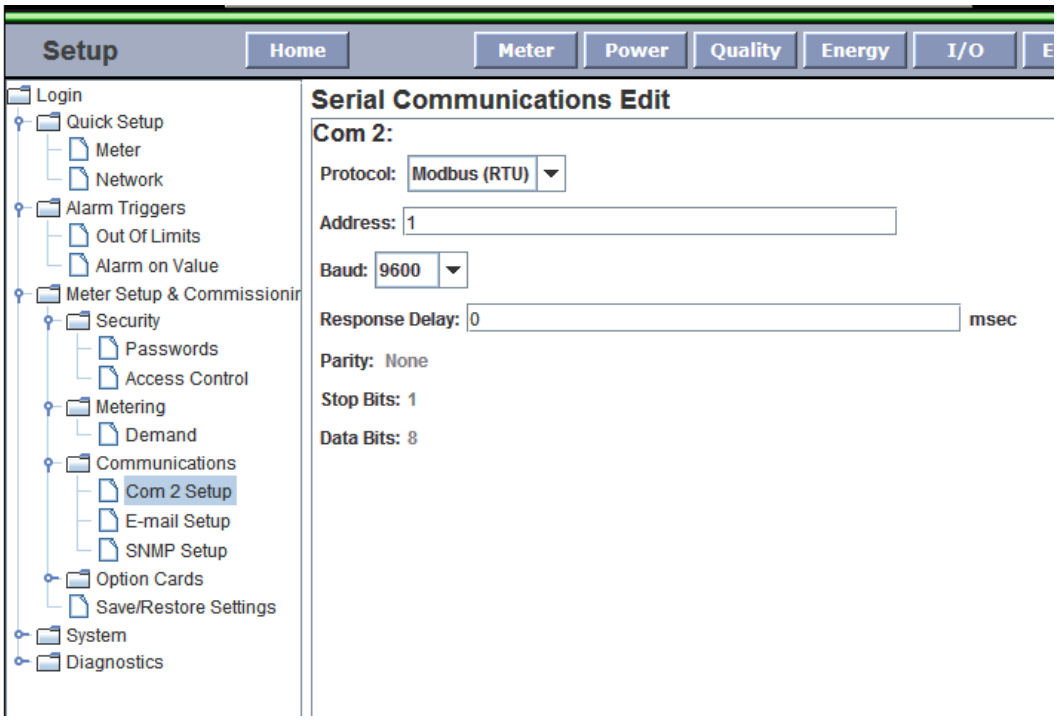
Communications Settings

Under **Communications**, you can set the serial communications parameters, the email settings (including the mail server and recipients), as well as the setup parameters for SNMP.

Communications Settings - Com 2 Setup

You can set the protocol, Modbus address, baud rate, response delay, parity, and stop and data bits for the RS-485 serial connection. The protocol is selectable between Modbus RTU, Modbus ASCII, or DNP.

Serial Communications Setup Page



Communications Settings - E-mail Setup

The PXM 2000 meter provides a highly configurable capability to report on meter activity via email. This is just like configuring an email application such as Outlook Express or Thunderbird. If you are unsure as to how to do this, ask your information technologies group or the person in charge of your mail server for assistance. You can configure:

- The SMTP server, including the server and account information. You'll need the following information from your system administrator to enter under Global email configuration. The meter cannot communicate using the Microsoft exchange email protocol.
  - A valid email account (user name and password).
  - The address of the SMTP mail server.
  - The email address of the account. Each meter can be assigned a separate email account. This allows you to easily determine which meter sent the email through its address.
- Email triggers. The meter will send emails in response to any event trigger that has been enabled for email, and this set includes a core set of hardware and communications failure triggers that you can also select. The contents of this list are dependent on the option card installed in the meter.
- Recipient specific settings for up to 10 email recipients. This includes settings for sending emails when an event occurs and/or clears and for sending periodic status emails. You can configure the email address for each recipient by selecting a recipient through the **Recipient** drop-down list and then configuring the recipient's address information by clicking the **Edit** button.

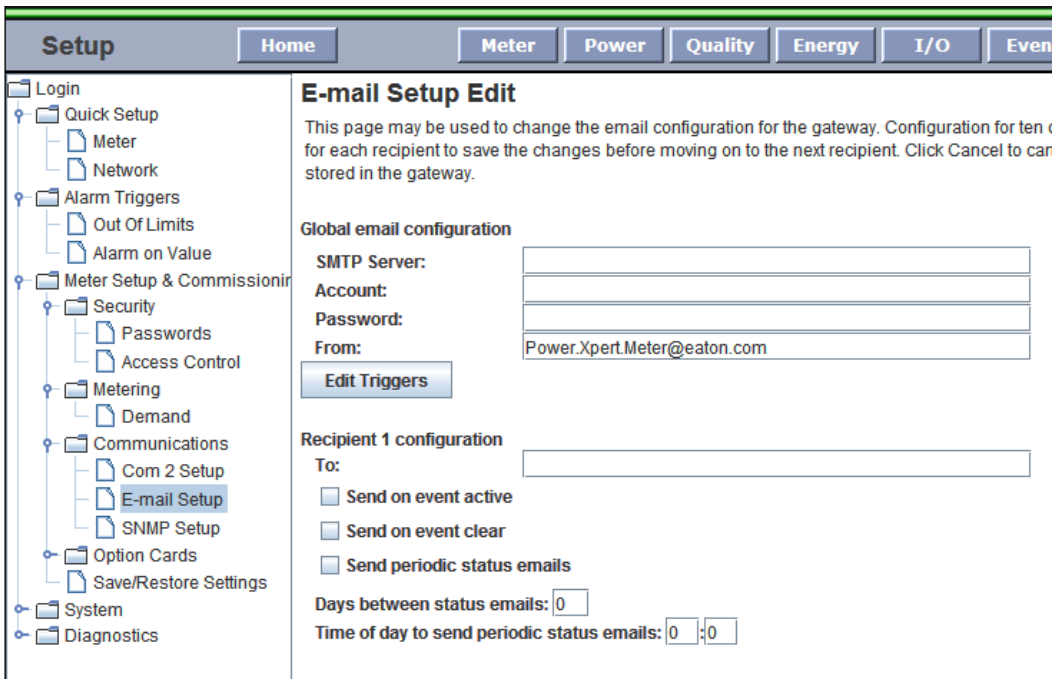
The following example is typical of the status emails sent by the meter:

```
Power Xpert Meter Status Report
Device=Power Xpert Meter 2000 Gateway Card
```

```
Time=09/24/2009 00:00:48
Serial Number=0036216826
MAC=00:20:85:00:FF:EA
Location=Meter Location
Model=PXM2270
```

The email also includes two comma-separated files containing a trend log file with the last 1000 entries and an event log file with the last 100 entries.

E-mail Setup Page

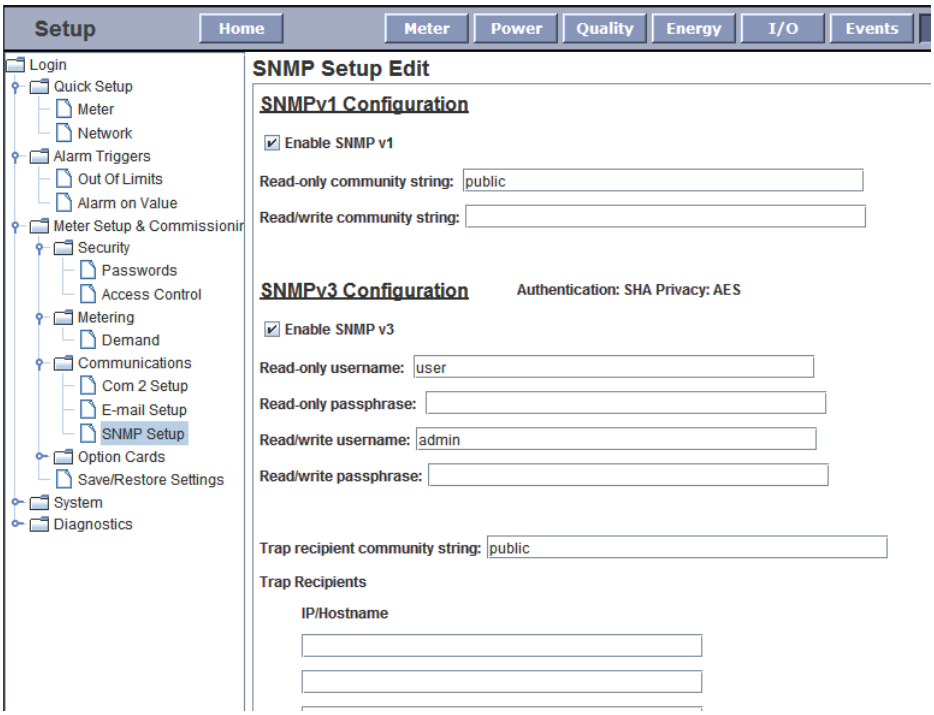


Communications Settings - SNMP Setup

The meter provides authentication configuration for both SNMP version 1 and version 3, and you can enable/disable either or both protocols. You can also specify up to six trap recipients. You can review/download the various supported management information bases (MIBs) by clicking **Help** and then clicking **Protocol Documents**.

Note that the requirements for the two protocols are different. For SNMP 1 you are only required to provide a read-only and read-write community string. However, SNMP 3 requires separate usernames and passphrases (passwords) for both read and write privileges. Consult your SNMP software documentation for more information.

SNMP Setup Edit Page



Option Cards

The PXM 2000 meter supports the following types of option cards:

- Digital Output (Relay Contact) / Digital Input Card
- Pulse Output (Solid State Relay Contacts) / Digital Input Card
- 1mA Output Card
- 20mA Output Card

Electrical specifications and installation information for each card is covered in Chapter 7.

Digital Output (Relay Contact) / Digital Input Card

The Relay Output/Digital Input Option Card has:

- Two relay contact outputs for load switching
- Two wet/dry contact sensing digital inputs.
- Accumulators in the software which count the transitions of the **Inputs** and **Outputs**.

A typical use of this card is to monitor the status of circuit breakers or relays.

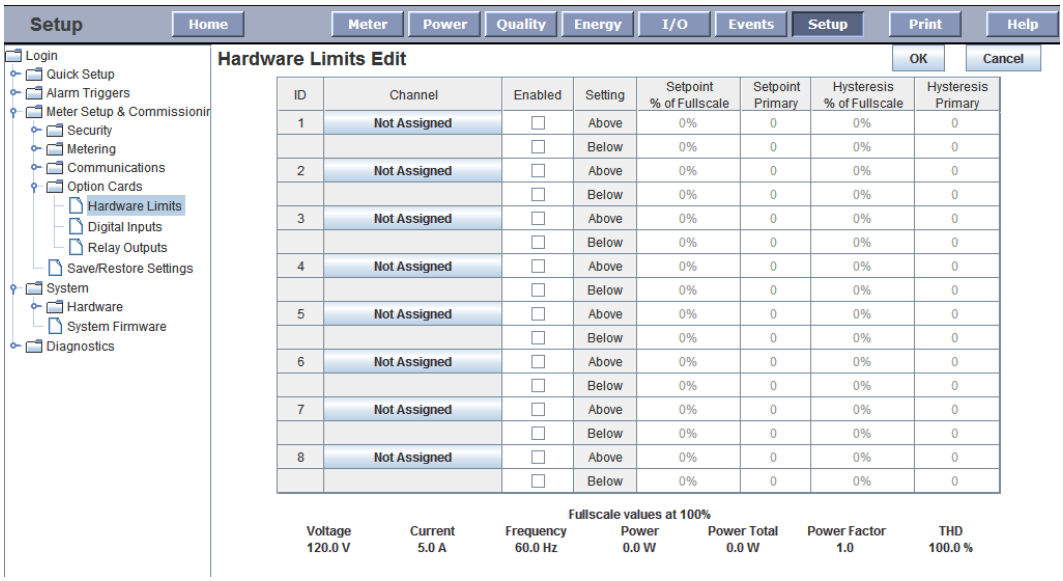
Important: First use the **Hardware Limits Edit** screen to set up the limits you want to assign to an **Output**.

You can can use the **Hardware Limits Edit** screen to configure up to eight limits. When configuring this page, keep the following in mind:

- Channel selects the electrical parameter through the **Set Limit Channel** dialog box. The various electrical measurements from the meter are grouped under the categories of **Demand**, **Reading**, and Total Harmonic Distortion (**THD**).

- The **Enabled** check boxes activate the **Above** and **Below** settings. When active, the output is triggered for when that condition occurs. Once active, you can click any of the **Setpoint** and **Hysteresis** fields and edit their contents.

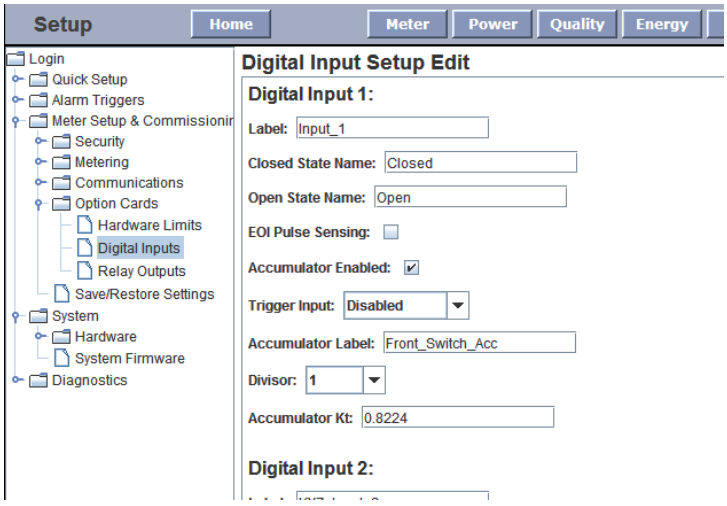
Hardware Limits Edit Page



You can use the **Digital Input Setup Edit** page to configure the relay inputs. You can assign labels for the open and closed states as well as the accumulator. You can also disable/enable the accumulator as well as the set the state of the **Trigger Input**: **Disabled**, **Open to Close**, **Close to Open**, or **Any Transition**.

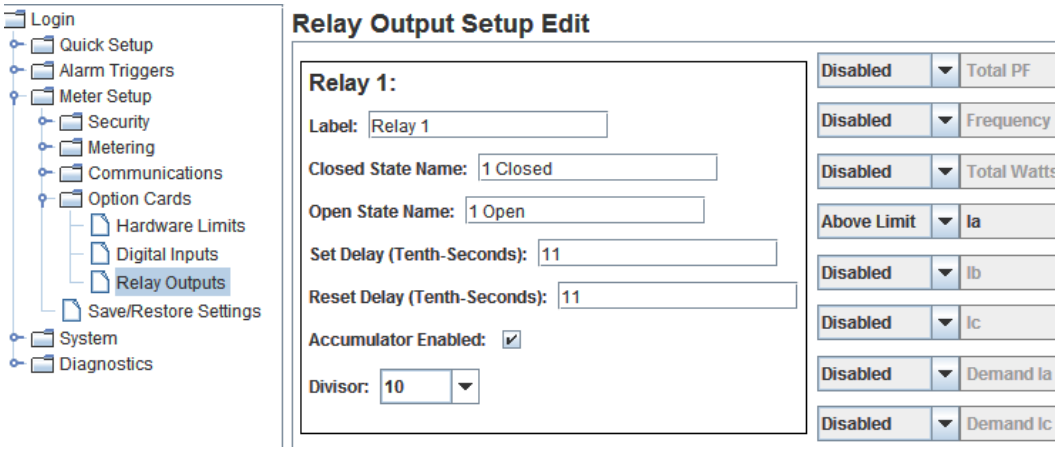
You can use the digital inputs to accept pulses from gas or water meters. The divisor is a compression factor you can use to keep the results within the meter's ability to report. Without the compression factor, the accumulator might roll over either too much or too rapidly and lose history.

Digital Input Setup Edit Page



Use the **Relay Outputs Setup Edit** page to set the output behavior of the relays. The count reflects the number of times the relay has energized. (You can define the labels, state names, operating delays, and configure the accumulator. The **Divisor** is a compression factor for the accumulator, and you can select 1, 10, 100, 1000, 10000, and 100000. For example, if you choose a **Divisor** of 10, each time 10 state changes occur, the accumulator count will increment by 1.

Relay Output Setup Edit Page



Pulse Output (Solid State Relay Contacts) / Digital Input Card

This option card has:

- Four pulse outputs via solid state contacts.
- Four wet/dry contact sensing digital inputs.

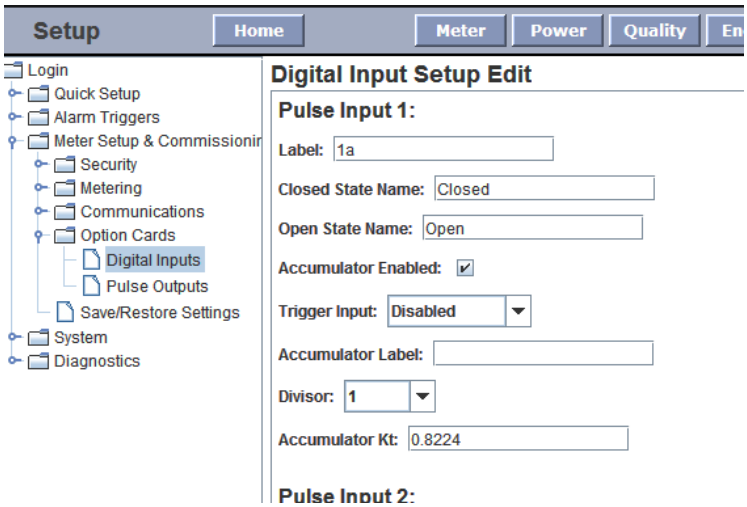
Accumulators in the software count the pulses of the **Inputs** and **Outputs** (the accumulators are shown on the I/O page. Typically, this card is used in a sub-metering application where a pulse output is needed. The **Input Accumulators** (which perform the same function as the inputs on the relay card) allow you to count the pulses from another device, for example, a KYZ module or another meter. The **Output Accumulators** allow you to count the pulses being output by the card.

For inputs, you can configure up to four inputs for your card, and assign a **Label**, **Open State Label**, and **Closed State Label** for each. You can also set labels and other information for **Accumulators** for the **Inputs**. Triggers can be set as **Disabled**, **Open to Close**, **Close to Open**, or on **Any Transition**.

Accumulators have both a compression factor and a device output ration setting. The divisor is a compression factor for the accumulator, and you can select 1, 10, 100, 1000, 10000, and 100000. For example, if you choose a **Divisor** of 10, each time 10 state changes occur, the accumulator count will increment by 1. The **Accumulator Kt** is the output ratio from the device that is being input into the meter. For example, if you have a KYZ module that is outputting a pulse every 1.8 kWh, you would set the **Accumulator Kt** to be the value of the KYZ; in this case either 1.8 or a ratio of that number.

The Set Limit Channel dialog box associates a meter measure, like kW Demand or Phase B current, with each of the outputs, and gets a pulse train whose rate reflects the present value of that measure.

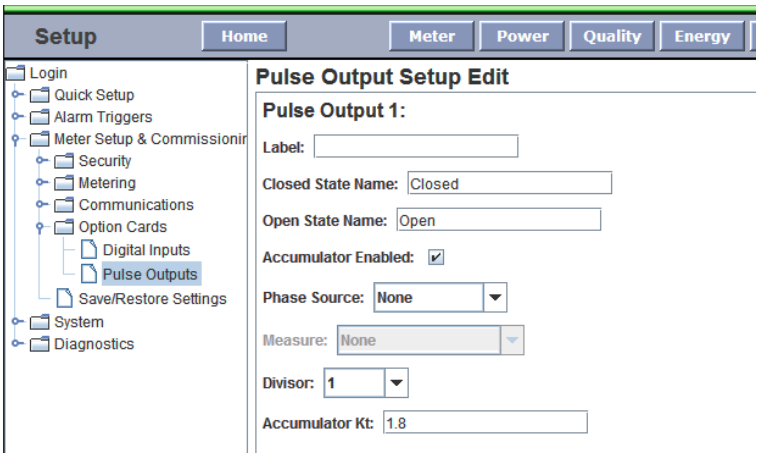
Digital Input Setup Edit Page



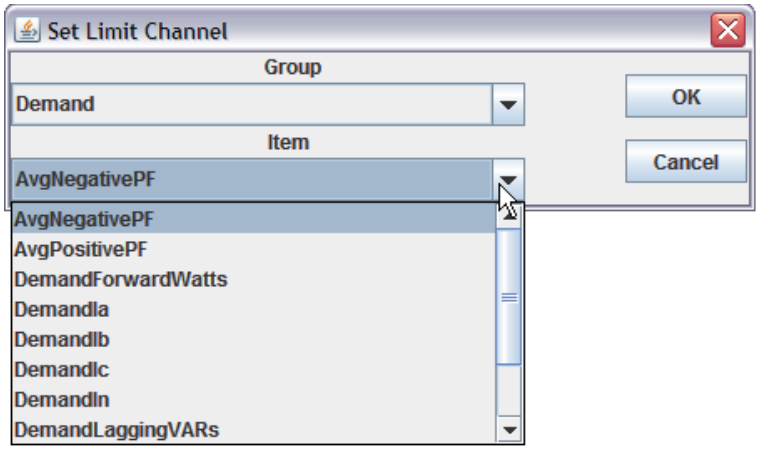
You can set up to four outputs for your card. You can define the labels, state names, and configure the accumulator. You can also specify the phase source and measurement.

Accumulators have both a compression factor and a device output ration setting. The divisor is a compression factor for the accumulator, and you can select 1, 10, 100, 1000, 10000, and 100000. For example, if you choose a **Divisor** of 10, each time 10 state changes occur, the accumulator count will increment by 1. The **Accumulator Kt** is the output ratio from the device that is being input into the meter. For example, if you have a KYZ module that is outputting a pulse every 1.8 kWh, you would set the **Accumulator Kt** to be the value of the KYZ; in this case either 1.8 or a ratio of that number.

Pulse Output Setup Edit



Set Limit Channel Dialog Box.



Option Cards - 0-1 mA Analog Output Card and 4-20 mA Output Card

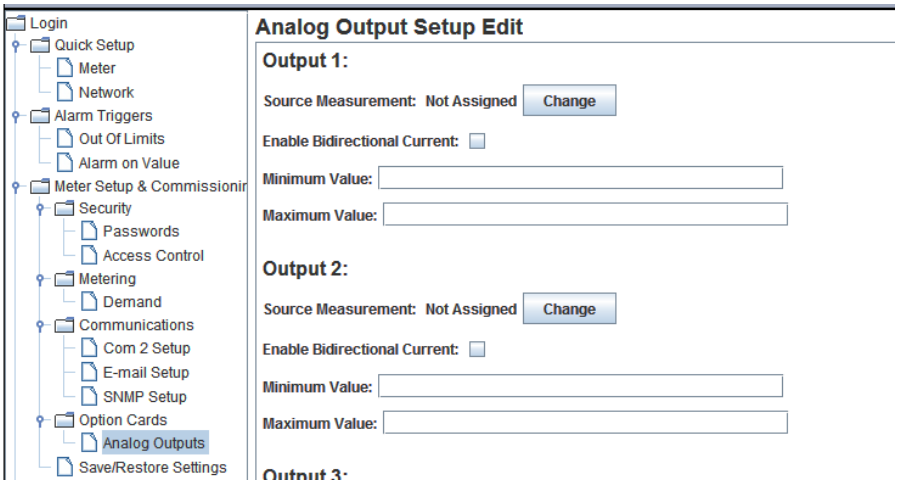
The 0-1mA Output Option Card is an analog communication card, which transmits a standard, bi-directional 0-1 milliamp signal. Bi-derectional is useful when you want the output (-1 to 1 V) to reflect the sign of a measure that goes negative (like VAR). Although you can configure offset-from-zero limits, normally you should set the high and low limits to have the same absolute value to keep it symmetrical.

The 4-20 mA card transmits a standard, uni-directional 4-20 milliamp signal. An example use of either card is in enabling the meter to communicate with an RTU (Remote Terminal Unit).

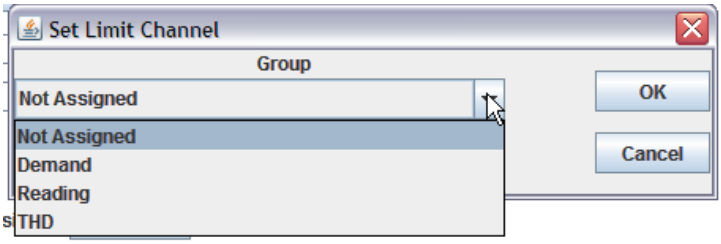
Setup for the cards is almost identical. The only difference is that the 4-20 mA is unidirectional.

The **Analog Output Setup Edit** page provides access to configuration parameters for each of the card outputs. Each output can be assigned to one of any of the electrical parameters in the **Demand**, **Reading**, or **THD** groups. You can set the **Minimum** and **Maximum** values as well as enable **Bidirectional Current** (0-1 mA card only).

Analog Output Setup Edit Page



Setting the Source Measurement



Save/Restore Settings

Configuration files can be downloaded to your local file system and then uploaded from your local file system to a meter. This is a handy convenience feature, especially if you're setting up multiple meters with either the same or similar settings. You can set up one meter, download the configuration file to your local computer, and then upload that same configuration file to other meters. Files are downloaded to your browser's default download folder.

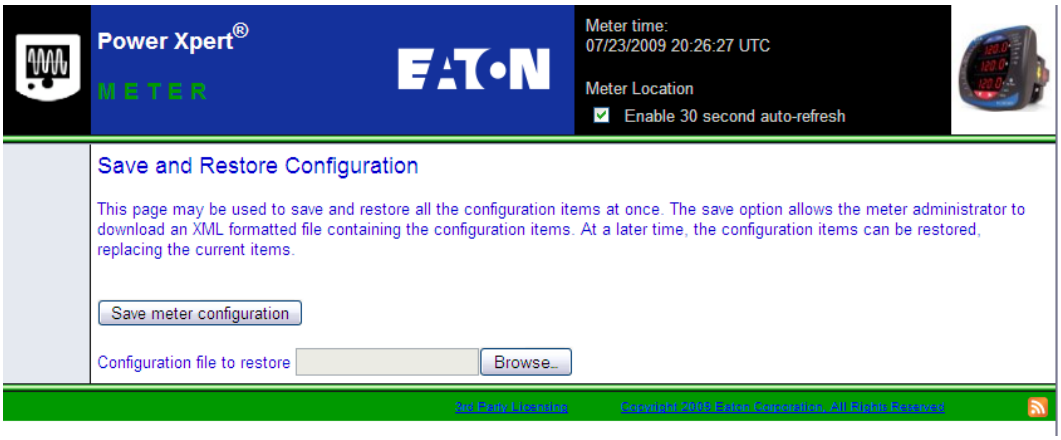
To download the current configuration file:

1. Click **Setup**.
2. Expand **Meter Setup & Commissioning**.
3. Click **Save/Restore Settings.**
4. Click the **Save and Restore Configuration** button.
5. When prompted, type the **admin** account **User Name** and **Password**.
6. Click the **Save meter configuration** button.
7. Click **OK**.

To upload a configuration file to a meter:

1. Click **Setup**.
2. Expand **Meter Setup & Commissioning**.
3. Click **Save/Restore Settings.**
1. Click the **Browse** button beside the **Configuration file to restore** field.
2. Select the configuration `.xml` file.
3. Click **OK**.

Save/Restore Configuration Page


Power Xpert®
METER
Meter time:
07/23/2009 20:26:27 UTC
Meter Location
Enable 30 second auto-refresh
Save and Restore Configuration
This page may be used to save and restore all the configuration items at once. The save option allows the meter administrator to download an XML formatted file containing the configuration items. At a later time, the configuration items can be restored, replacing the current items.
Save meter configuration
Configuration file to restore
Browse...

System Setup

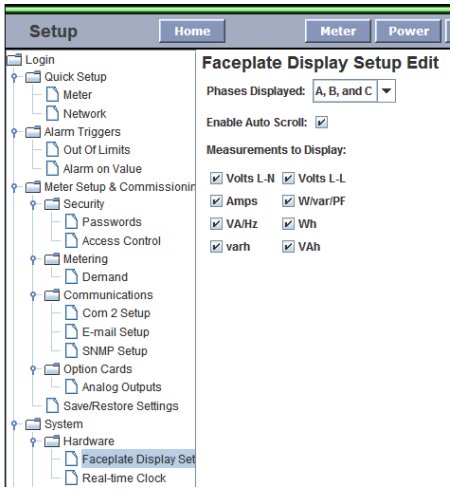
The **System Setup** page is divided into two sections: Hardware and System Firmware.

Hardware Setup - Faceplate Setup

You can configure the meter's faceplate display. Options include:

- **Phases Displayed: A; A and B; A, B, and C**. This field determines which phases display on the faceplate. For example, if you select A and B, only those two phases will be displayed on the faceplate.
- **Auto Scroll:** This field enables or disables the scrolling of selected readings on the faceplate. If enabled, the readings scroll every 5 seconds.
- **Measurements to Display**: Check the boxes of the readings you want displayed on the faceplate of the meter. You must select at least one reading.

Faceplate Display Setup Page



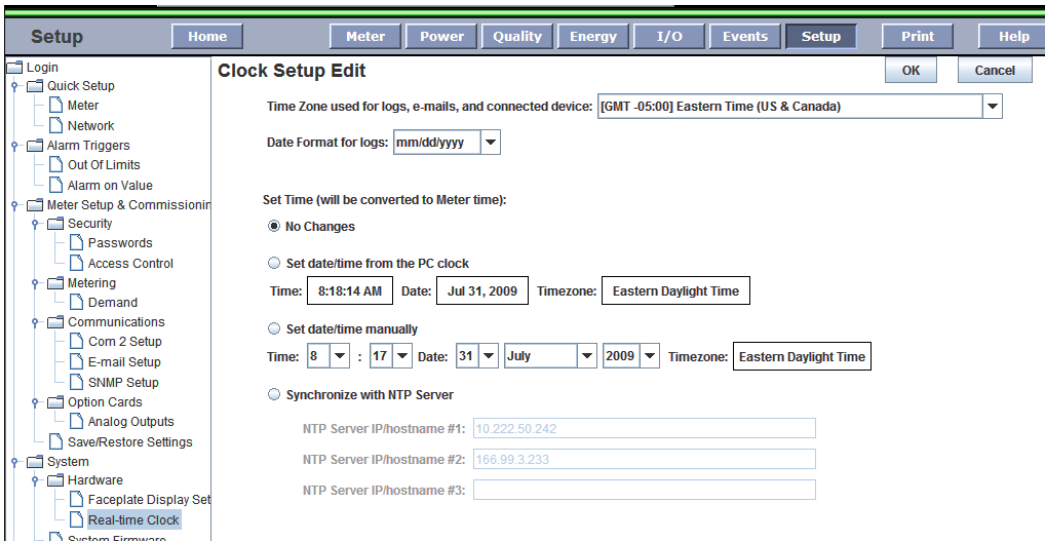
Hardware - Real-Time Clock

The Power Xpert Meter uses a real-time clock for time keeping. The meter can be configured to adjust for Daylight Savings Time (DST) based on the time zone selection and to synchronize time using NTP. By using NTP, time will be maintained by the real time clock, and the real time clock will be calibrated and time corrected using NTP.

The **Clock Setup Edit** page allows you to set the time in hours and minutes (in 24 hour time), select a time sync option, and set the date for the meter. If NTP is selected for time synch, an IP address of the NTP server should be set. When selecting NTP (Network Time Protocol) as the Time Sync Source, at least one IP Address must be entered (as many as three NTP server IP addresses may be entered). A list of public NTP servers is available at: http://support.ntp.org/bin/view/Servers/WebHome.

Note: The **Time Zone** and **Date** format settings only affect logs and e-mails.

Clock Setup Edit Page



Hardware - System Firmware

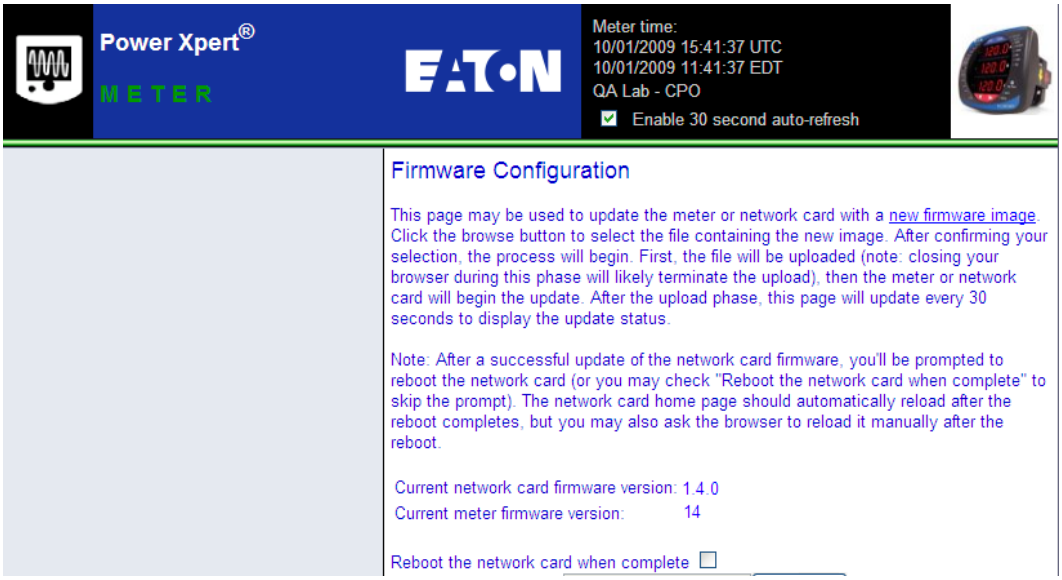
The **System Firmware** page displays both the meter and gateway firmware version. Firmware files can be downloaded from Eaton and the web page can be accessed through the **Firmware Configuration** page. Click the **Upgrade** button to launch the **Firmware Configuration** page.

To download firmware trom the Firmware Configuration Page:

1. Select the **Reboot when complete** checkbox.
2. Click the new firmware image link, which will direct the meter to the eaton.com website where firmware files are stored.
3. Select the firmware type from the list.
4. Fill out the form (if required).
5. Download the firmware to your local file system.
6. Click the **Browse** button.
7. Select the firmware file.
8. Click the **Open** button.

Note: On rare instances (such as a problem occurring in the firmware upgrade) you may need to reload the meter page after rebooting the meter. It can take around five minutes for values to display after a reboot.

Firmware Configuration Page


Power Xpert®
METER
EATON
Meter time:
10/01/2009 15:41:37 UTC
10/01/2009 11:41:37 EDT
QA Lab - CPO
Enable 30 second auto-refresh
Firmware Configuration
This page may be used to update the meter or network card with a new firmware image. Click the browse button to select the file containing the new image. After confirming your selection, the process will begin. First, the file will be uploaded (note: closing your browser during this phase will likely terminate the upload), then the meter or network card will begin the update. After the upload phase, this page will update every 30 seconds to display the update status.
Note: After a successful update of the network card firmware, you'll be prompted to reboot the network card (or you may check "Reboot the network card when complete" to skip the prompt). The network card home page should automatically reload after the reboot completes, but you may also ask the browser to reload it manually after the reboot.
Current network card firmware version: 1.4.0
Current meter firmware version: 14
Reboot the network card when complete

Diagnostics

You can access the system log or a page that displays the names, serial numbers, and versions of the various components in the meter.

Diagnostics - System Log

The system log shows system events, such as changes to settings, firmware updates, and meter restarts. Each event carries a time-and-date stamp and a severity level. You can print the log by clicking the **Print** button; however, the printout contains a screen image, not the entire log. To print an entire log you may need to use the scroll bar to reposition the log in the window and print it in sections.

Note: You can tell who has made configuration changes to the meter from the log as it not only logs changes but the IP address of the computer from which the changes were made.

System Log Page

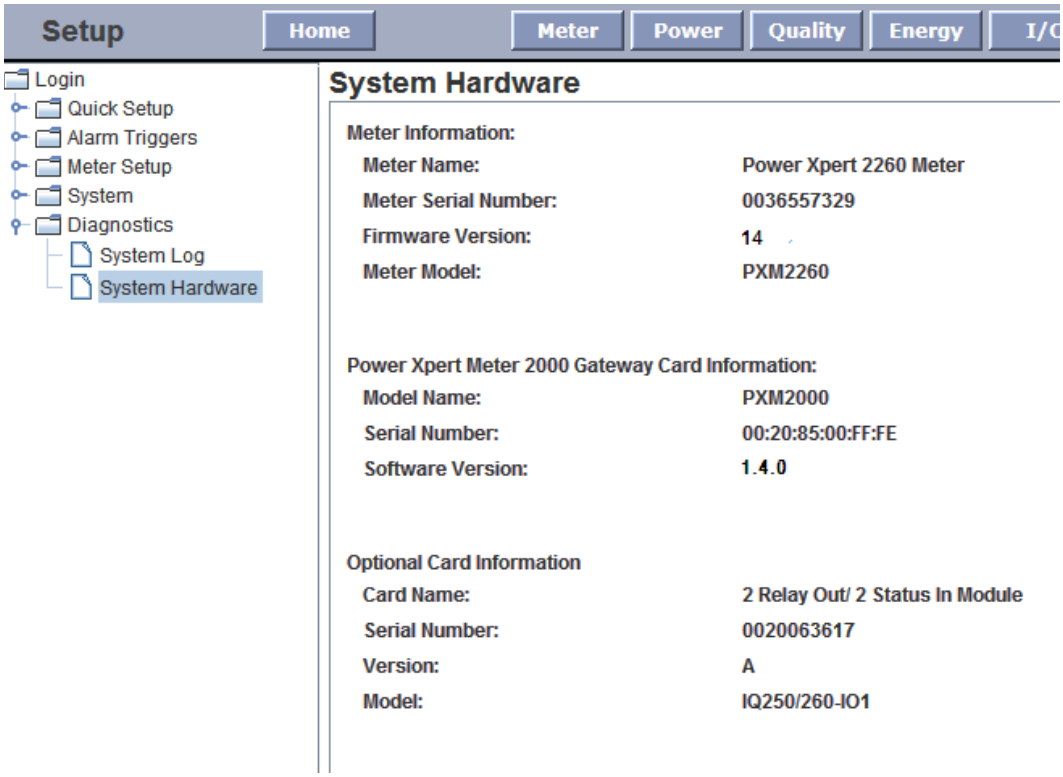
System Log

894	10/02/2009 16:15	47.648258	Informational	Rebooting card	
895	10/02/2009 16:24	43.212271	Informational	Meter module Phases to Display on Meter Front set to 3 by Web-Services://admin@99.999.45.81	admin@99.999.45.81 (Web-Services)
896	10/02/2009 16:24	43.455388	Informational	Meter module Front Display Volts L-N set to true by Web-Services://admin@99.999.45.81	admin@99.999.45.81 (Web-Services)
897	10/02/2009 16:24	43.675067	Informational	Meter module Front Display Watt-VARs-PF set to true by Web-Services://admin@99.999.45.81	admin@99.999.45.81 (Web-Services)
898	10/02/2009 16:24	43.865706	Informational	Meter module Front Display VA-Hz set to true by Web-Services://admin@99.999.45.81	admin@99.999.45.81 (Web-Services)
899	10/02/2009 16:24	44.097539	Informational	Meter module Front Display Vah set to true by Web-Services://admin@99.999.45.81	admin@99.999.45.81 (Web-Services)
900	10/02/2009 16:24	59.281280	Informational	Saving configuration change(s) and restarting Meter module.	
901	10/02/2009 16:24	59.419713	Informational	Reset command: Restart the Meter	

Diagnostics - System Hardware

The **System Hardware** page provides a single, convenient page you can use to check information about the meter and the cards installed in it.

System Hardware Page



11 ROOT CERTIFICATE AUTHORITY INSTALLATION

You can improve the security of your Power Xpert Meter on the web by installing a root certificate authority (CA). A CA is a trusted third-party organization that issues digital certificates for use with encrypted digital transactions. The digital certificate guarantees that the company holding a certificate is who it claims to be.

You can use the meter without installing a root CA (using http), but the transactions will not be as secure as with the root CA (using https). The performance of the meter is not measurably reduced by using secure transactions.

This section explains root CA installation for:

- Microsoft Internet Explorer 6
- Microsoft Internet Explorer 7

Installing Root CA with Microsoft Internet Explorer 6

To install a certificate through Internet Explorer 6

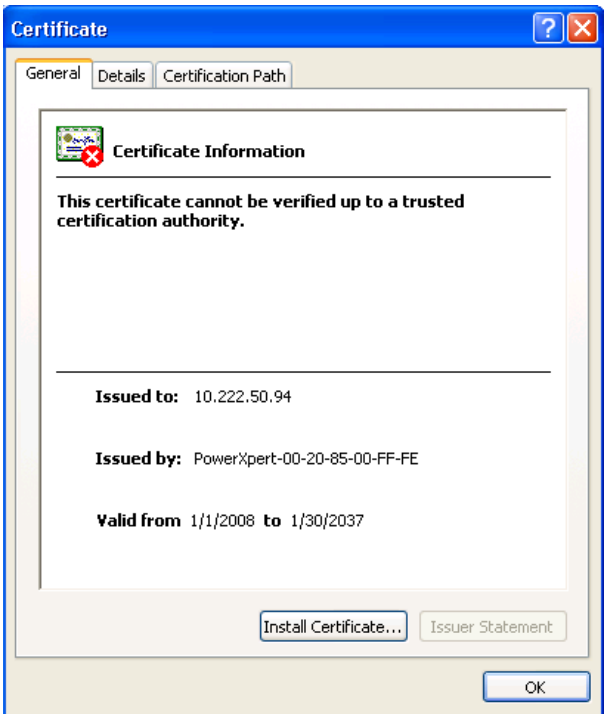
1. Open the browser, type the IP address of the meter in the address bar, and select **Go**. For example: `https://192.168.1.1/ca.html`. The security alert dialog box appears.

The security alert dialog box

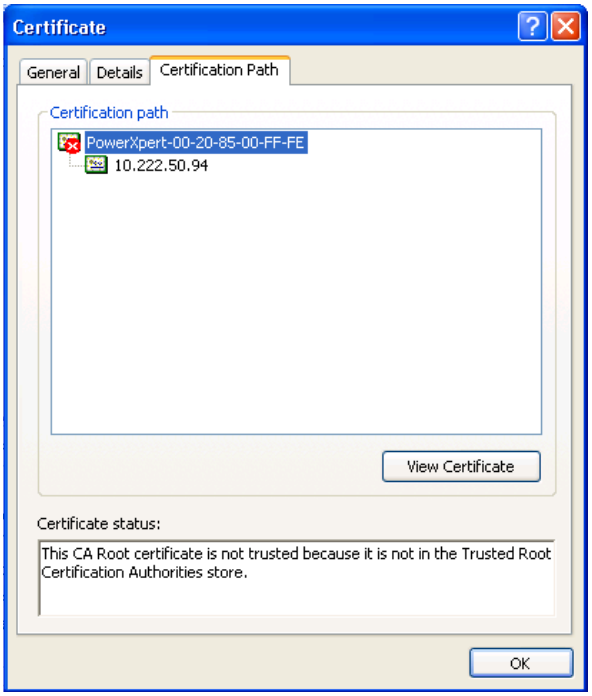
Security Alert
Information you exchange with this site cannot be viewed or changed by others. However, there is a problem with the site's security certificate.
The security certificate was issued by a company you have not chosen to trust. View the certificate to determine whether you want to trust the certifying authority.
The security certificate date is valid.
The security certificate has a valid name matching the name of the page you are trying to view.
Do you want to proceed?
Yes
No
View Certificate

Click the **View Certificate** button. The certificate dialog box appears.

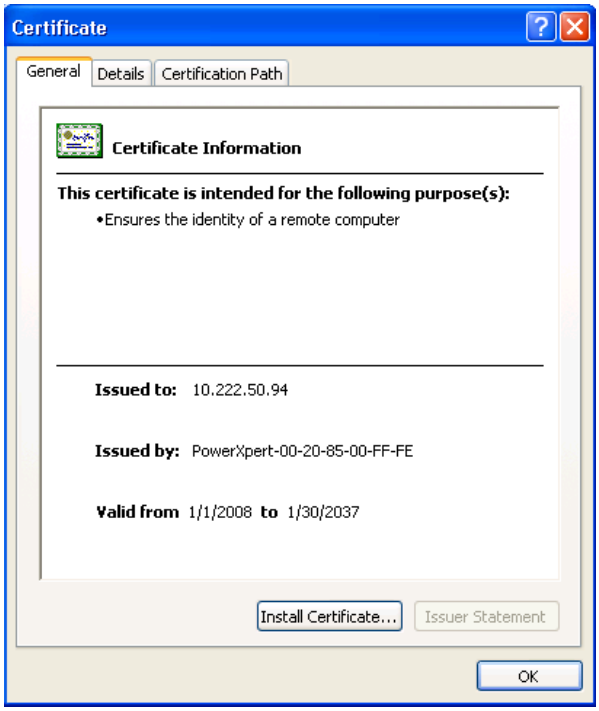
Certificate Dialog Box



2. Select the **Certification Path** tab. On the tab, select the line with **PowerXpert** followed by a series of hexadecimal digits.



3. Click the **View Certificate** button. The **Certificate** dialog box appears.



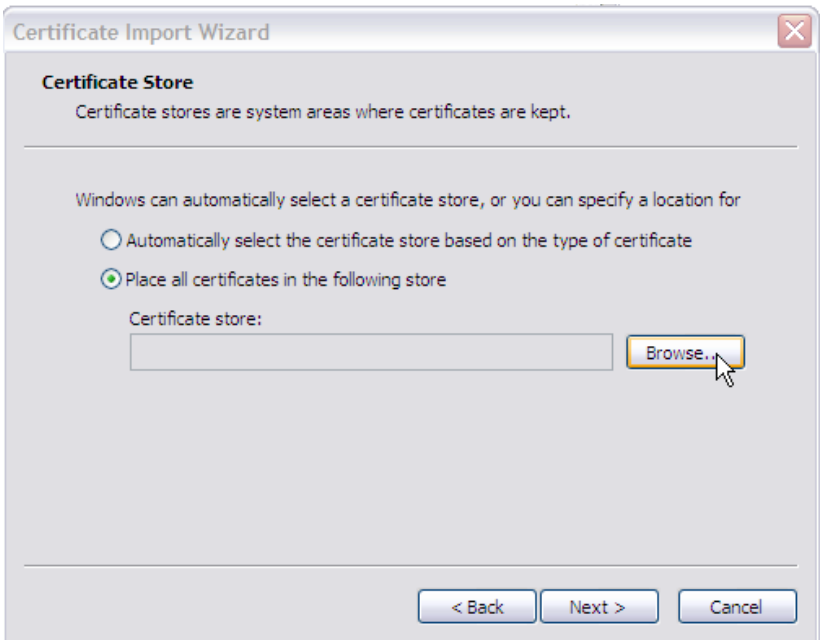
4. Click the **Install Certificate** button. The **Certificate Import Wizard** appears.

Certificate Import Wizard

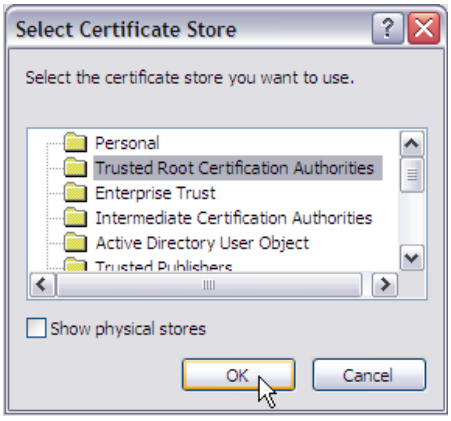
Certificate Import Wizard
Welcome to the Certificate Import Wizard
This wizard helps you copy certificates, certificate trust lists, and certificate revocation lists from your disk to a certificate store.
A certificate, which is issued by a certification authority, is a confirmation of your identity and contains information used to protect data or to establish secure network connections. A certificate store is the system area where certificates are kept.
To continue, click Next.
< Back
Next >
Cancel

Click the **Next** button. The store dialog box appears.

Certificate Import Wizard - store dialog

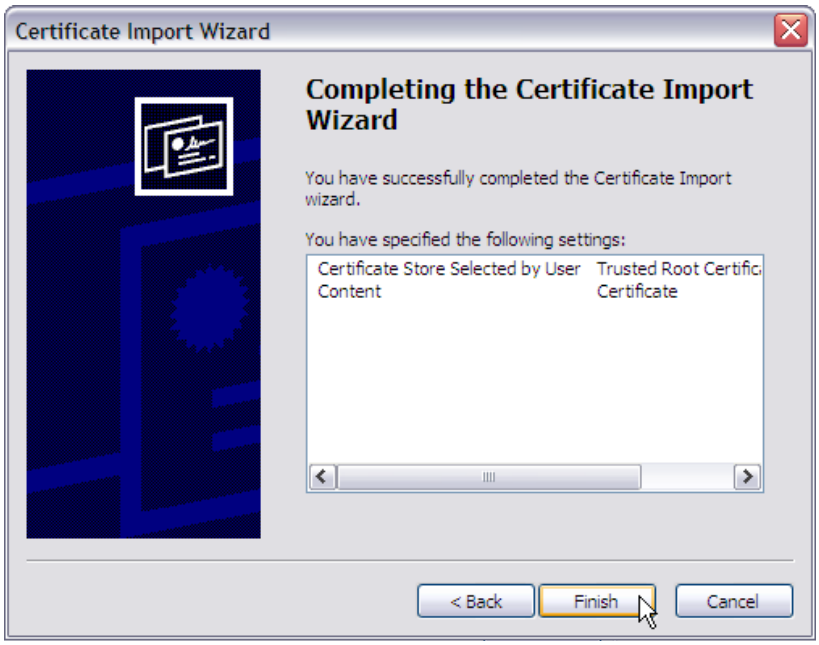

Certificate Import Wizard
Certificate Store
Certificate stores are system areas where certificates are kept.
Windows can automatically select a certificate store, or you can specify a location for
Automatically select the certificate store based on the type of certificate
Place all certificates in the following store
Certificate store:
Browse...
< Back
Next >
Cancel

5. Select **Place all certificates in the following store** and then click **Browse**.
6. Select **Trusted Root Certificate Authorities** and then click **OK.**



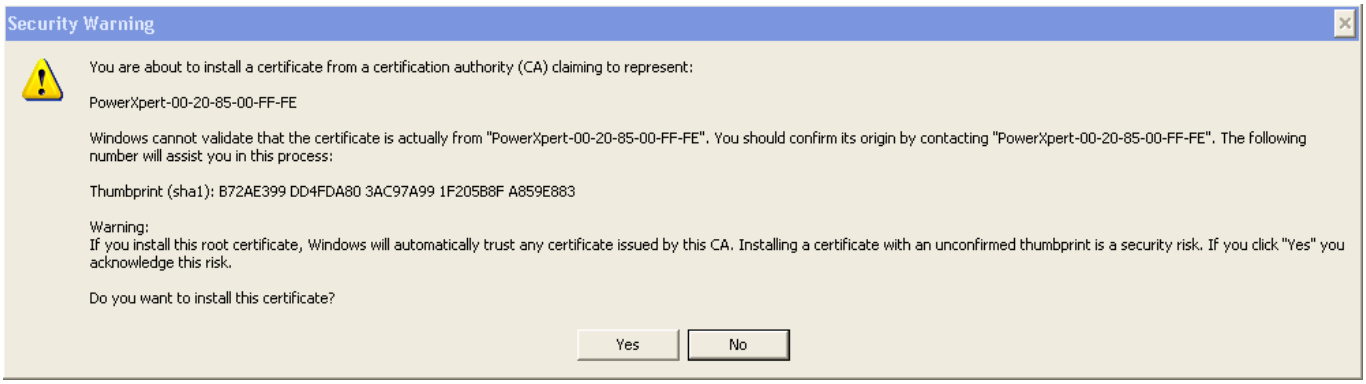
7. Click **Next.**

Certificate Import Wizard - successfully stored



8. The certificate wizard displays a completed dialog. Click **Finish**. The **Security Warning** dialog box will appear.

Security Warning dialog box


Security Warning
You are about to install a certificate from a certification authority (CA) claiming to represent:
PowerXpert-00-20-85-00-FF-FE
Windows cannot validate that the certificate is actually from "PowerXpert-00-20-85-00-FF-FE". You should confirm its origin by contacting "PowerXpert-00-20-85-00-FF-FE". The following number will assist you in this process:
Thumbprint (sha1): B72AE399 DD4FDA80 3AC97A99 1F205B8F A859E883
Warning:
If you install this root certificate, Windows will automatically trust any certificate issued by this CA. Installing a certificate with an unconfirmed thumbprint is a security risk. If you click "Yes" you acknowledge this risk.
Do you want to install this certificate?
Yes
No

9. Click **Yes** to install the CA.
10. A message box opens to verify that the import was successful.

Import Successful message box

11. Click **OK**.

12. Click **OK** to close the dialog box. The installation process is complete.

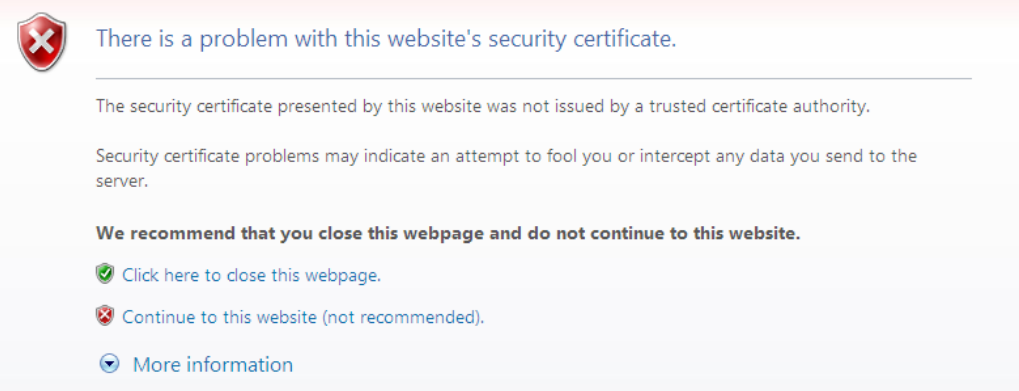
You can now access the meter using the https protocol (for example, `https://192.168.1.1/`).

Installing Root CA with Microsoft Internet Explorer 7

To install a certificate using Microsoft Internet Explorer 7:

1. Open the browser, type the IP address of the meter in the address bar, and select **Go**. For example: `https://192.168.1.1/ca.html`.
2. You may see the following alert page. If so, click **Continue to this website**.

Security certificate problem page

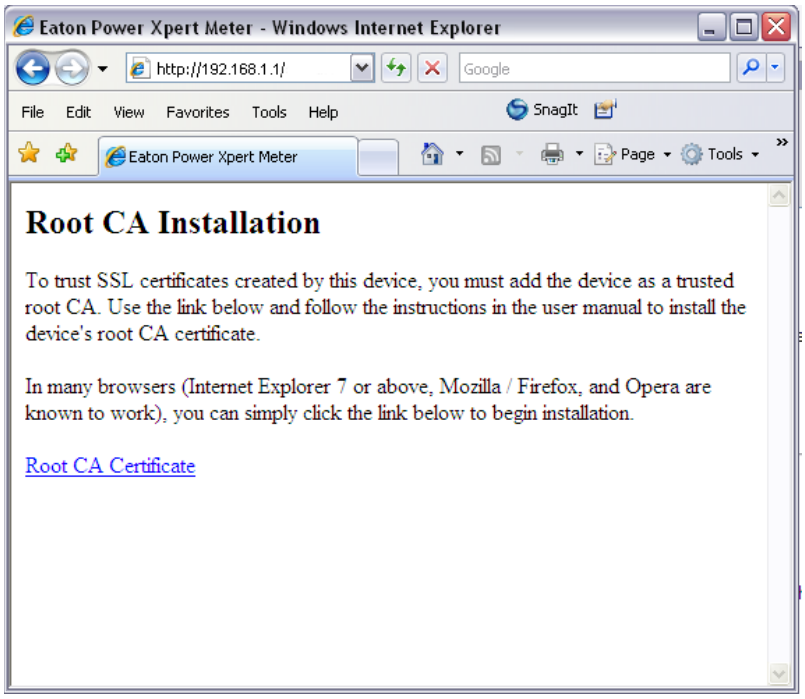

There is a problem with this website's security certificate.
The security certificate presented by this website was not issued by a trusted certificate authority.
Security certificate problems may indicate an attempt to fool you or intercept any data you send to the server.
We recommend that you close this webpage and do not continue to this website.
Click here to close this webpage.
Continue to this website (not recommended).
More information

3. If the security certificate problem page appears, you'll next see the following security warning dialog box. Click **Yes**.

Warning: Security dialog box

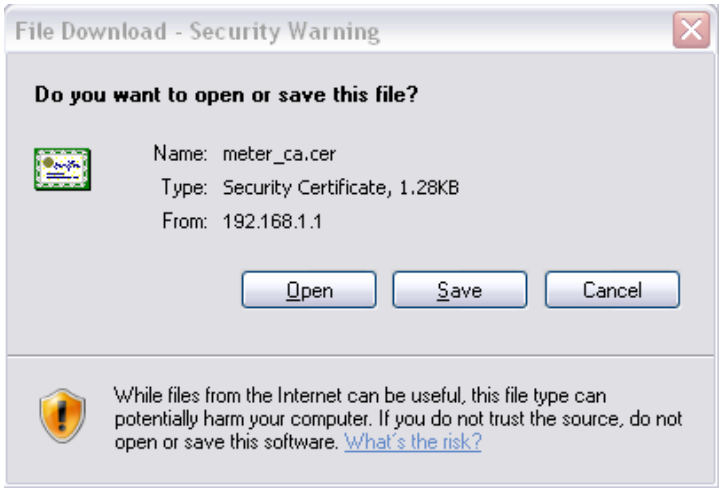
4. The install CA certificate page appears. Click the **Root CA Certificate** link.

Install CA certificate page


Eaton Power Xpert Meter - Windows Internet Explorer
http://192.168.1.1/
Google
File Edit View Favorites Tools Help
SnagIt
Eaton Power Xpert Meter
Page Tools
Root CA Installation
To trust SSL certificates created by this device, you must add the device as a trusted root CA. Use the link below and follow the instructions in the user manual to install the device's root CA certificate.
In many browsers (Internet Explorer 7 or above, Mozilla / Firefox, and Opera are known to work), you can simply click the link below to begin installation.
Root CA Certificate

5. Click the **Open** button.

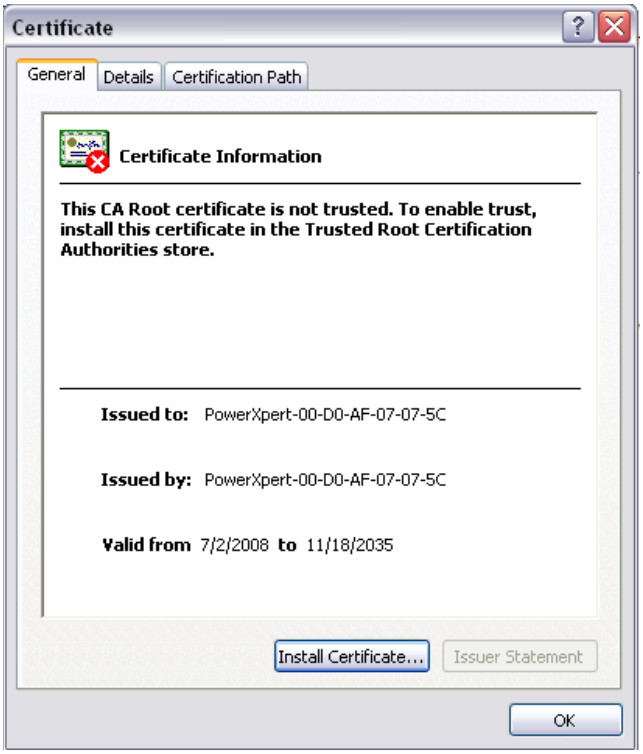
Figure 2. File download dialog box


File Download - Security Warning
Do you want to open or save this file?
Name: meter_ca.cer
Type: Security Certificate, 1.28KB
From: 192.168.1.1
Open
Save
Cancel
While files from the Internet can be useful, this file type can potentially harm your computer. If you do not trust the source, do not open or save this software. What's the risk?

6. In the **Certificate** dialog box, click the **Install Certificate** button.

NOTE: The certificate cannot be verified yet because it is issued by a nontrusted CA.

Figure 3. Certification Path Window



7. Follow the remaining steps for installing a certificate using Internet Explorer 6, starting with step 2.

A NAVIGATION MAPS

Introduction

You can configure the meter and perform related tasks using the buttons on the meter face.

- Chapter 6 contains a description of the buttons on the meter face and instructions for programming the meter using them.
- The meter can also be programmed using software. See chapter 8 for instructions on programming the meter using the Configuration software.

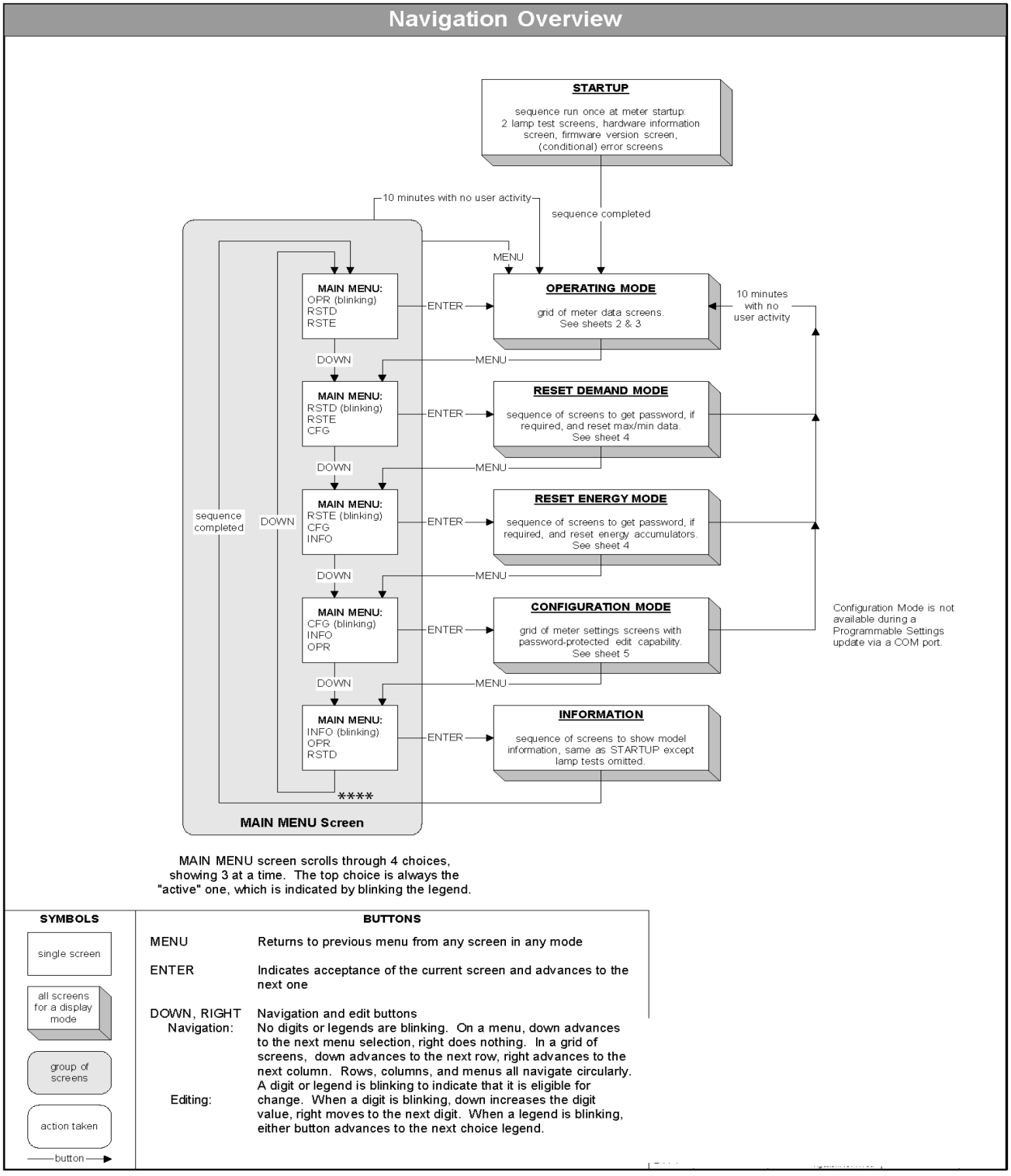
Navigation Maps (Sheets 1 to 4)

The PXM 2000 Series Navigation Maps begin on the next page. The maps show in detail how to move from one screen to another and from one Display Mode to another using the buttons on the face of the meter. All Display Modes will automatically return to Operating Mode after 10 minutes with no user activity.

Navigation Map Titles:

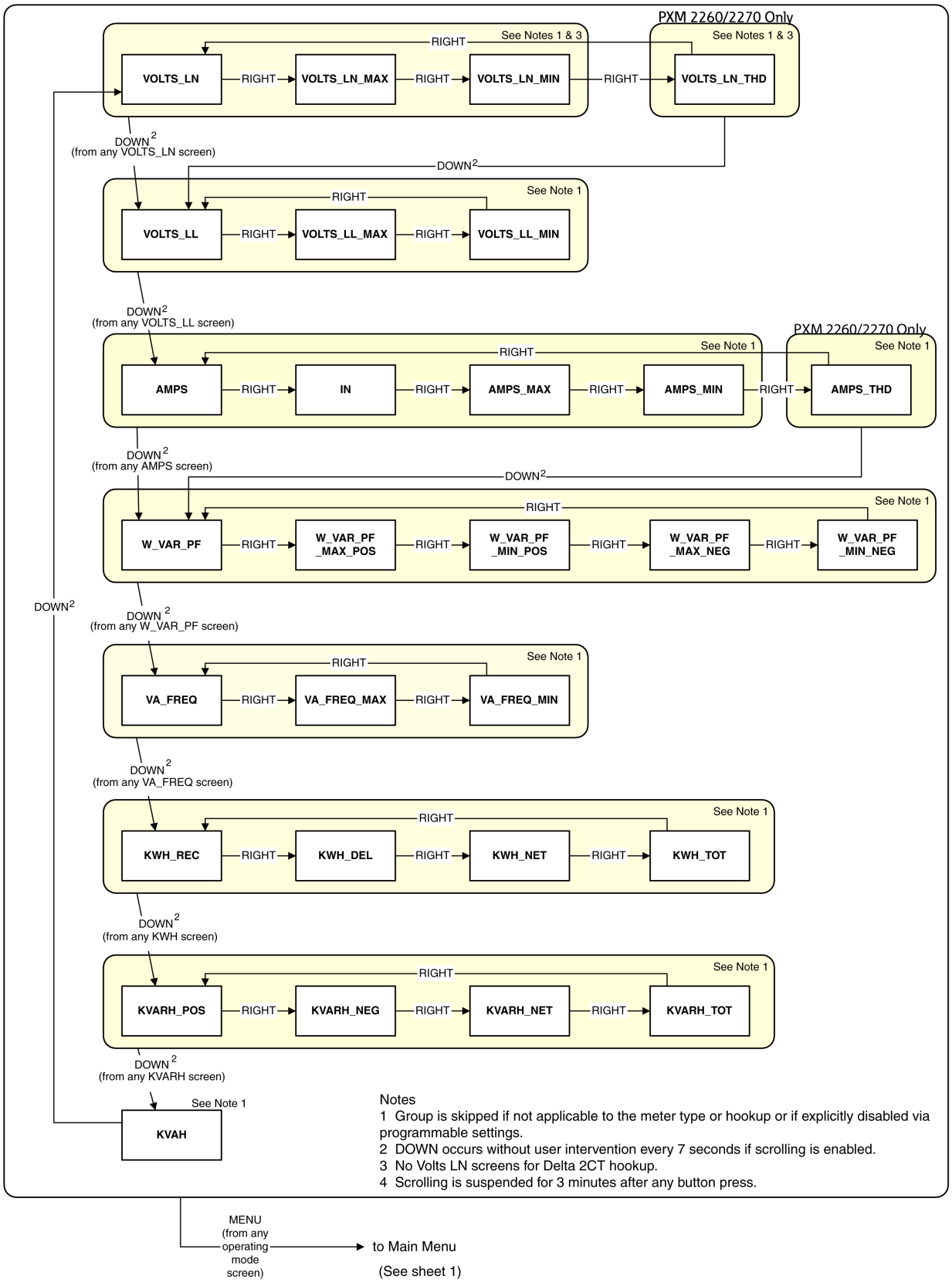
- Main Menu Screens (Sheet 1)
- Operating Mode Screens (Sheet 2)
- Reset Mode Screens (Sheet 3)
- Configuration Mode Screens (Sheet 4)

Main Menu Screens (Sheet 1)

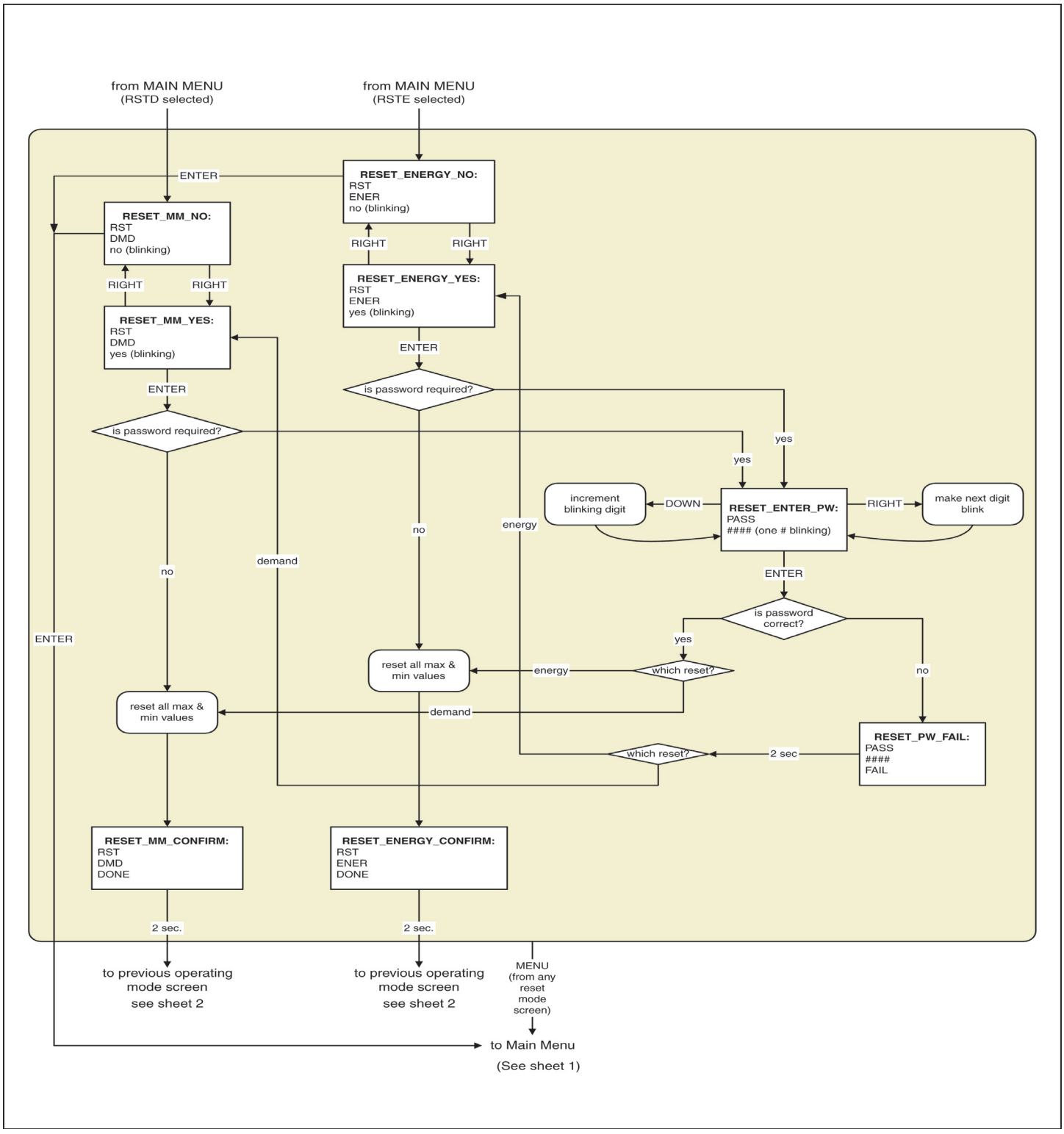

Navigation Overview
STARTUP
sequence run once at meter startup:
2 lamp test screens, hardware information screen, firmware version screen, (conditional) error screens
10 minutes with no user activity
sequence completed
MENU
MAIN MENU:
OPR (blinking)
RSTD
RSTE
ENTER
OPERATING MODE
grid of meter data screens.
See sheets 2 & 3
10 minutes with no user activity
DOWN
MENU
MAIN MENU:
RSTD (blinking)
RSTE
CFG
ENTER
RESET DEMAND MODE
sequence of screens to get password, if required, and reset max/min data.
See sheet 4
DOWN
MENU
sequence completed
DOWN
MAIN MENU:
RSTE (blinking)
CFG
INFO
ENTER
RESET ENERGY MODE
sequence of screens to get password, if required, and reset energy accumulators.
See sheet 4
DOWN
MENU
MAIN MENU:
CFG (blinking)
INFO
OPR
ENTER
CONFIGURATION MODE
grid of meter settings screens with password-protected edit capability.
See sheet 5
Configuration Mode is not available during a Programmable Settings update via a COM port.
DOWN
MENU
MAIN MENU:
INFO (blinking)
OPR
RSTD
ENTER
INFORMATION
sequence of screens to show model information, same as STARTUP except lamp tests omitted.
****
MAIN MENU Screen
MAIN MENU screen scrolls through 4 choices, showing 3 at a time. The top choice is always the "active" one, which is indicated by blinking the legend.
SYMBOLS
single screen
all screens for a display mode
group of screens
action taken
button
BUTTONS
MENU
Returns to previous menu from any screen in any mode
ENTER
Indicates acceptance of the current screen and advances to the next one
DOWN, RIGHT
Navigation:
Navigation and edit buttons
No digits or legends are blinking. On a menu, down advances to the next menu selection, right does nothing. In a grid of screens, down advances to the next row, right advances to the next column. Rows, columns, and menus all navigate circularly.
Editing:
A digit or legend is blinking to indicate that it is eligible for change. When a digit is blinking, down increases the digit value, right moves to the next digit. When a legend is blinking, either button advances to the next choice legend.

**** If the PXM 2000 meter has an Ethernet Gateway card, there is an IP Menu option after the Information screen.

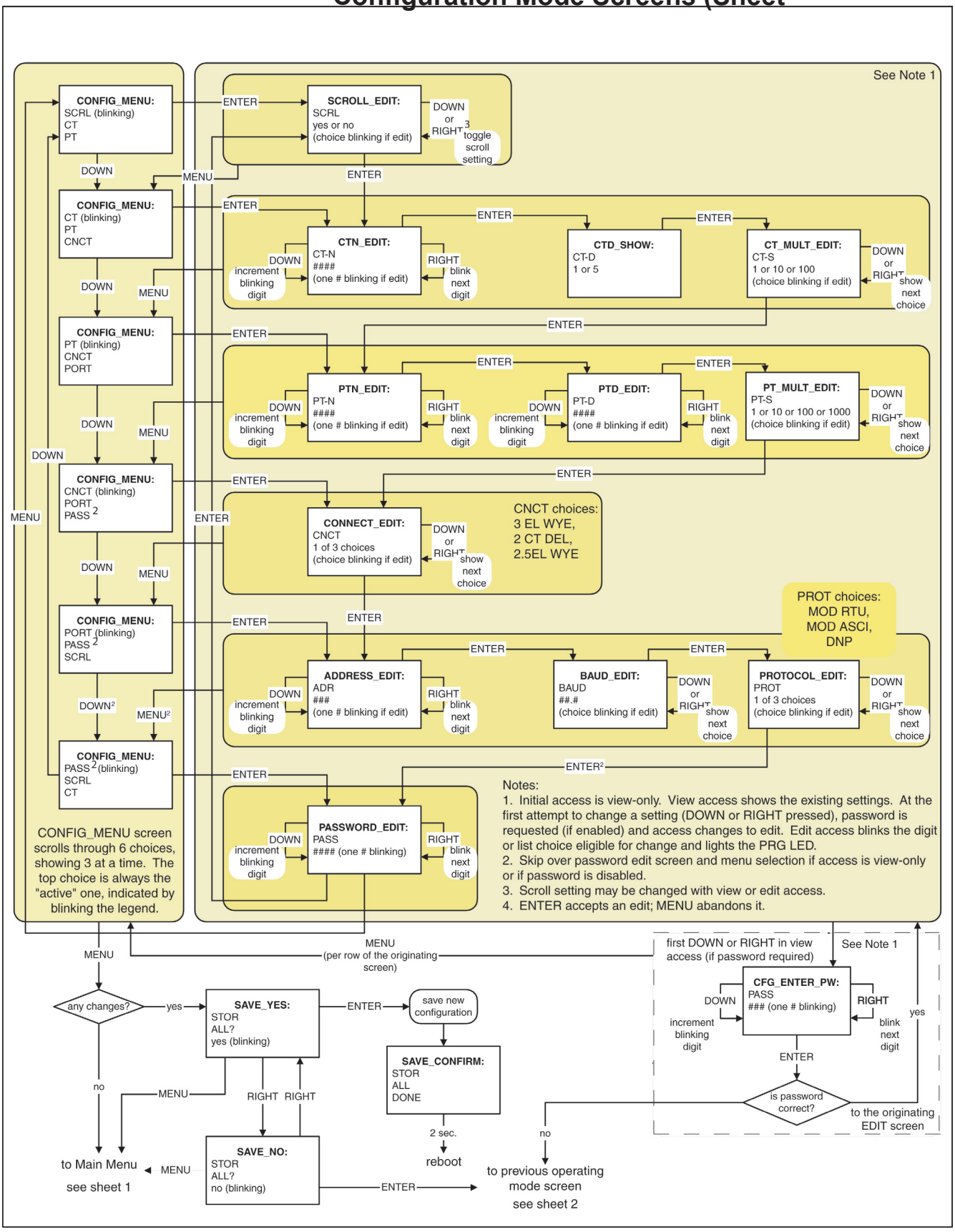
Operating Mode Screens (Sheet 2)



Reset Mode Screens (Sheet 3)



Configuration Mode Screens (Sheet



B DIP SWITCH DESCRIPTION

The DIP Switch definitions for the Gateway Card are listed in the following table.

S1 Position Number	OFF Position (Default)	ON Position
1	Enable previously stored network configuration settings (Normal mode).	Override network settings to assign a private IP address (Configuration mode); the port is set to 192.168.1.1.
2	Reserved	Reserved
3	Normal behavior	Reset the HTTP passwords to the defaults on boot up (`user` and `admin`). After a successful boot, the switch should be turned back off before rebooting the card.
4	Reserved	Reserved
5	Reserved	Reserved
6	Normal behavior	Reset the card to factory defaults on boot up. After a successful boot, the switch should be turned back off before rebooting the card.
7	Reserved	Reserved
8	Reserved	Reserved

C MODBUS REGISTER MAPS

TCP/IP Register Map

The following pages define the Modbus Register Map for the Power Xpert Meter 2770 in the Wye configuration. This is the largest of the Power Xpert Meter maps, and the maps of other models and wiring configurations are subsets of this.

Parameter Name	Display Name	Base Address (0-based)	Discrete	Units	Type	Size (bytes)	Is Time-stamp?	Bit Offset	Swap Bytes	Swap Words	Divider	Multiplier	Date Spec	Alarm On False	Writable	Possible Values
VendorName/Value	Vendor Name	1032	No	no-units	STRING	64	No		No	No					No	
ModelName/Value	Model Name	1064	No	no-units	STRING	64	No		No	No					No	
iDisplayName/Value	Display Name	1096	No	no-units	STRING	64	No		No	No					Yes	
SerialNumber/Value	Serial Number	1276	No	no-units	STRING	64	No		No	No					No	
SoftwareVersion/Value	Software Version	2108	No	no-units	STRING	48	No		No	No					No	
iDeviceVoltsRating/Value	Nominal Voltage	1355	No	volts	UINT	4	No		No	No					Yes	
iNumPhases/Value	Phases to Display on Meter Front	1361	No	no-units	UINT	2	No		No	No					Yes	1; 2; 3
iFieldReplaceableUnit/Value	Field Replaceable Unit	1605	No	no-units	UINT	2	No		No	No					Yes	true; false
iNominalFrequency/Value	Nominal Frequency	1668	No	hertz	UINT	2	No		No	No					No	
iDeviceAmpsRating/Value	Output Current Rating	1810	No	amperes	UINT	2	No		No	No					Yes	
sStatus/Value	Status	3000	No	no-units	UINT	2	No		No	No					No	Off(0); Normal(1); Limp mode(2); Warmup(3); Unknown(4); Unknown(5); Boot up(6); Boot up(7)
mACVAB/Value	Vab	4002	No	volts	FLOAT	4	No		No	No					No	
mACVBC/Value	Vbc	4004	No	volts	FLOAT	4	No		No	No					No	
mACVCA/Value	Vca	4006	No	volts	FLOAT	4	No		No	No					No	
mACVavgLL/Value	V(L-L) Average	4008	No	volts	FLOAT	4	No		No	No					No	
mACVAN/Value	Van	4010	No	volts	FLOAT	4	No		No	No					No	
mACVBN/Value	Vbn	4012	No	volts	FLOAT	4	No		No	No					No	
mACVCN/Value	Vcn	4014	No	volts	FLOAT	4	No		No	No					No	
mACVavgLN/Value	V(L-N) Average	4016	No	volts	FLOAT	4	No		No	No					No	
mPhaseAngleVab/Value	Phase Angle Vab	4497	No	degrees-phase	FLOAT	4	No		No	No					No	
mPhaseAngleVbc/Value	Phase Angle Vbc	4499	No	degrees-phase	FLOAT	4	No		No	No					No	
mPhaseAngleVca/Value	Phase Angle Vca	4501	No	degrees-phase	FLOAT	4	No		No	No					No	
mACVavgLLLongtermAvg/Value	V(L-L) Average - Long-term Average	4525	No	volts	FLOAT	4	No		No	No					No	

Parameter Name	Display Name	Base Address (0-based)	Discrete	Units	Type	Size (bytes)	Is Time-stamp?	Bit Offset	Swap Bytes	Swap Words	Divider	Multiplier	Date Spec	Alarm On False	Writable	Possible Values
mACVavgLNLongtermAvg/Value	V(L-N) Average - Long-term Average	4527	No	volts	FLOAT	4	No		No	No					No	
mACIA/Value	Ia	5002	No	amperes	FLOAT	4	No		No	No					No	
mACIB/Value	Ib	5004	No	amperes	FLOAT	4	No		No	No					No	
mACIC/Value	Ic	5006	No	amperes	FLOAT	4	No		No	No					No	
mACIN/Value	In	5010	No	amperes	FLOAT	4	No		No	No					No	
mACIavg/Value	Iavg	5012	No	amperes	FLOAT	4	No		No	No					No	
mACIAPeakDemand/Value	Demand Ia Peak	5014	No	amperes	FLOAT	4	No		No	No					No	
mACIBPeakDemand/Value	Demand Ib Peak	5016	No	amperes	FLOAT	4	No		No	No					No	
mACICPeakDemand/Value	Demand Ic Peak	5018	No	amperes	FLOAT	4	No		No	No					No	
mDemandIa/Value	Demand Ia	5250	No	amperes	FLOAT	4	No		No	No					No	
mDemandIb/Value	Demand Ib	5252	No	amperes	FLOAT	4	No		No	No					No	
mDemandIc/Value	Demand Ic	5254	No	amperes	FLOAT	4	No		No	No					No	
mDemandIn/Value	Demand In	5258	No	amperes	FLOAT	4	No		No	No					No	
mDemandInPeak/Value	Demand In Peak	5262	No	amperes	FLOAT	4	No		No	No					No	
mPhaseAngleIa/Value	Phase Angle Ia	5338	No	degrees-phase	FLOAT	4	No		No	No					No	
mPhaseAngleIb/Value	Phase Angle Ib	5340	No	degrees-phase	FLOAT	4	No		No	No					No	
mPhaseAngleIc/Value	Phase Angle Ic	5342	No	degrees-phase	FLOAT	4	No		No	No					No	
mACIALongtermAvg/Value	Ia - Long-term Average	5448	No	amperes	FLOAT	4	No		No	No					No	
mACIBLongtermAvg/Value	Ib - Long-term Average	5450	No	amperes	FLOAT	4	No		No	No					No	
mACICLongtermAvg/Value	Ic - Long-term Average	5452	No	amperes	FLOAT	4	No		No	No					No	
mACINLongtermAvg/Value	In - Long-term Average	5454	No	amperes	FLOAT	4	No		No	No					No	
mACIAPeakDemandTime/Value	Time of Peak Demand Ia	5546	No	no-units	DATE	6	No		No	No			ymd-HMS		No	
mACIBPeakDemandTime/Value	Time of Peak Demand Ib	5549	No	no-units	DATE	6	No		No	No			ymd-HMS		No	
mACICPeakDemandTime/Value	Time of Peak Demand Ic	5552	No	no-units	DATE	6	No		No	No			ymd-HMS		No	
mACINPeakDemandTime/Value	Time of Peak Demand In	5555	No	no-units	DATE	6	No		No	No			ymd-HMS		No	
mWA/Value	Real Power Phase A	6000	No	watts	FLOAT	4	No		No	No					No	
mWB/Value	Real Power Phase B	6002	No	watts	FLOAT	4	No		No	No					No	
mWC/Value	Real Power Phase C	6004	No	watts	FLOAT	4	No		No	No					No	
mWtotal/Value	Real Power	6006	No	watts	FLOAT	4	No		No	No					No	
mVAA/Value	Apparent Power Phase A	6064	No	volt-amperes	FLOAT	4	No		No	No					No	
mVAB/Value	Apparent Power Phase B	6066	No	volt-amperes	FLOAT	4	No		No	No					No	
mVAC/Value	Apparent Power Phase C	6068	No	volt-amperes	FLOAT	4	No		No	No					No	
mVAtotal/Value	Apparent Power	6070	No	volt-amperes	FLOAT	4	No		No	No					No	
mVarA/Value	Reactive Power Phase A	6128	No	volt-amperes-reactive	FLOAT	4	No		No	No					No	

Parameter Name	Display Name	Base Address (0-based)	Discrete	Units	Type	Size (bytes)	Is Time-stamp?	Bit Offset	Swap Bytes	Swap Words	Divider	Multiplier	Date Spec	Alarm On False	Writable	Possible Values
mVarB/Value	Reactive Power Phase B	6130	No	volt-amperes-reactive	FLOAT	4	No		No	No					No	
mVarC/Value	Reactive Power Phase C	6132	No	volt-amperes-reactive	FLOAT	4	No		No	No					No	
mVARtotal/Value	Reactive Power	6134	No	volt-amperes-reactive	FLOAT	4	No		No	No					No	
mPFapparentA/Value	PF App Phase A	6212	No	power-factor	FLOAT	4	No		No	No					No	
mPFapparentB/Value	PF App Phase B	6214	No	power-factor	FLOAT	4	No		No	No					No	
mPFapparentC/Value	PF App Phase C	6216	No	power-factor	FLOAT	4	No		No	No					No	
mPFapparentTotal/Value	PF Apparent	6220	No	power-factor	FLOAT	4	No		No	No					No	
mPFapparentTotal5MinIntAvg/Value	PF App Total Interval Avg	6316	No	power-factor	FLOAT	4	No		No	No					No	
mForwardEnergy/Value	Forward Real Energy	7004	No	watt-hours	FLOAT	4	No		No	No					No	
mReverseEnergy/Value	Reverse Real Energy	7006	No	watt-hours	FLOAT	4	No		No	No					No	
mNetEnergy/Value	Net Real Energy	7008	No	watt-hours	FLOAT	4	No		No	No					No	
mLeadingVARh/Value	Leading Reactive Energy	7010	No	volt-ampere-reactive-hours	FLOAT	4	No		No	No					No	
mLaggingVARh/Value	Lagging Reactive Energy	7012	No	volt-ampere-reactive-hours	FLOAT	4	No		No	No					No	
mNetVARh/Value	Net Reactive Energy	7014	No	volt-ampere-reactive-hours	FLOAT	4	No		No	No					No	
mVAh/Value	Apparent Energy	7016	No	volt-ampere-hours	FLOAT	4	No		No	No					No	
mDemandSumWatts/Value	Demand Sum Watts	7025	No	watts	FLOAT	4	No		No	No					No	
mDemandNetWatts/Value	Demand Net Watts	7027	No	watts	FLOAT	4	No		No	No					No	
mDemandSumVARs/Value	Demand Sum VARs	7031	No	volt-amperes-reactive	FLOAT	4	No		No	No					No	
mDemandNetVARs/Value	Demand Net VARs	7033	No	volt-amperes-reactive	FLOAT	4	No		No	No					No	
mTimeLastDemand/Value	Time Last Demand Window	7037	No	no-units	DATE	6	No		No	No			ymd-HMS		No	
mDemandType/Value	Demand Type	7165	No	no-units	UINT	2	No		No	No					Yes	Fixed(1); Sliding(2); Sync(3); Unknown(4)
mTotalDemandInterval/Value	Demand Interval	7166	No	minutes	FLOAT	4	No		No	No					No	5; 10; 15; 20; 30; 45; 60
mDemandSubinterval/Value	Demand Subinterval	7168	No	minutes	FLOAT	4	No		No	No					Yes	5; 15; 30; 60
mIntDemandForwardWatts/Value	Interval Demand Forward Watts	7170	No	watts	FLOAT	4	No		No	No					No	
mIntDemandReverseWatts/Value	Interval Demand Reverse Watts	7172	No	watts	FLOAT	4	No		No	No					No	

Parameter Name	Display Name	Base Address (0-based)	Discrete	Units	Type	Size (bytes)	Is Time-stamp?	Bit Offset	Swap Bytes	Swap Words	Divider	Multiplier	Date Spec	Alarm On False	Writable	Possible Values
mIntDemandLaggingVARs/Value	Interval Demand Lagging VARs	7174	No	volt-amperes-reactive	FLOAT	4	No		No	No					No	
mIntDemandLeadingVARs/Value	Interval Demand Leading VARs	7176	No	volt-amperes-reactive	FLOAT	4	No		No	No					No	
mIntDemandVAs/Value	Interval Demand VAs	7178	No	volt-amperes	FLOAT	4	No		No	No					No	
mDemandForwardWatts/Value	Demand Forward Watts	7220	No	watts	FLOAT	4	No		No	No					No	
mPeakDemandForwardWatts/Value	Peak Demand Forward Watts	7222	No	watts	FLOAT	4	No		No	No					No	
mTimeDatePeakDemandForward-Watts/Value	Peak Demand Forward Watts Time	7224	No		DATE	6	No		No	No			ymd-HMS		No	
mDemandReverseWatts/Value	Demand Reverse Watts	7262	No	watts	FLOAT	4	No		No	No					No	
mPeakDemandReverseWatts/Value	Peak Demand Reverse Watts	7264	No	watts	FLOAT	4	No		No	No					No	
mTimeDatePeakDemandReverse-Watts/Value	Peak Demand Reverse Watts Time	7266	No	no-units	DATE	6	No		No	No			ymd-HMS		No	
mDemandLaggingVARs/Value	Demand Lagging VARs	7303	No	volt-amperes-reactive	FLOAT	4	No		No	No					No	
mPeakDemandLaggingVARs/Value	Peak Demand Lagging VARs	7305	No	volt-amperes-reactive	FLOAT	4	No		No	No					No	
mTimeDatePeakDemandLagging-VARs/Value	Peak Demand Lagging VARs Time	7307	No	no-units	DATE	6	No		No	No			ymd-HMS		No	
mDemandLeadingVARs/Value	Demand Leading VARs	7345	No	volt-amperes-reactive	FLOAT	4	No		No	No					No	
mPeakDemandLeadingVARs/Value	Peak Demand Leading VARs	7347	No	volt-amperes-reactive	FLOAT	4	No		No	No					No	
mTimeDatePeakDemandLeading-VARs/Value	Peak Demand Leading VARs Time	7349	No	no-units	DATE	6	No		No	No			ymd-HMS		No	
mDemandVAs/Value	Demand VAs	7387	No	volt-amperes	FLOAT	4	No		No	No					No	
mPeakDemandVAs/Value	Peak Demand VAs	7389	No	volt-amperes	FLOAT	4	No		No	No					No	
mTimeDatePeakDemandVAs/Value	Peak Demand VAs Time	7391	No	no-units	DATE	6	No		No	No			ymd-HMS		No	
mDemandAmpsAvg/Value	Demand Current (3 Phase Avg)	7429	No	amperes	FLOAT	4	No		No	No					No	
mPeakDemandAmpsAvg/Value	Peak Demand Amps Avg	7431	No	amperes	FLOAT	4	No		No	No					No	
mTotalVARh/Value	Total Reactive Energy	7628	No	volt-ampere-reactive-hours	FLOAT	4	No		No	No					No	
mTotalEnergy/Value	Total Real Energy	7679	No	watt-hours	FLOAT	4	No		No	No					No	
mPeakDemandSumWatts/Value	Peak Demand Sum Watts	7683	No	watts	FLOAT	4	No		No	No					No	
mPeakDemandNetWatts/Value	Peak Demand Net Watts	7688	No	watts	FLOAT	4	No		No	No					No	
mPeakDemandSumVARs/Value	Peak Demand Sum VARs	7693	No	volt-amperes-reactive	FLOAT	4	No		No	No					No	
mPeakDemandNetVARs/Value	Peak Demand Net VARs	7698	No	volt-amperes-reactive	FLOAT	4	No		No	No					No	

Parameter Name	Display Name	Base Address (0-based)	Discrete	Units	Type	Size (bytes)	Is Time-stamp?	Bit Offset	Swap Bytes	Swap Words	Divider	Multiplier	Date Spec	Alarm On False	Writable	Possible Values
mTimePeakDemandNetVARs/Value	Time Peak Demand Net VARs	7700	No	no-units	DATE	6	No		No	No			ymd-HMS		No	
mIntDemandSumWatts/Value	Interval Demand Sum Watts	7707	No	watts	FLOAT	4	No		No	No					No	
mIntDemandSumVARs/Value	Interval Demand Sum VARs	7709	No	volt-amperes-reactive	FLOAT	4	No		No	No					No	
mPFatPeakDemandForwardWatts/Value	Power Factor at Peak Demand Forward Watts	7831	No	power-factor	FLOAT	4	No		No	No					No	
mPFatPeakDemandReverseWatts/Value	Power Factor at Peak Demand Reverse Watts	7841	No	power-factor	FLOAT	4	No		No	No					No	
mPFatPeakDemandVA/Value	Power Factor at Peak Demand VA	7849	No	power-factor	FLOAT	4	No		No	No					No	
mPFatPeakDemandLeadingVars/Value	Power Factor at Peak Demand Leading Vars	7851	No	power-factor	FLOAT	4	No		No	No					No	
mPFatPeakDemandLaggingVars/Value	Power Factor at Peak Demand Lagging Vars	7853	No	power-factor	FLOAT	4	No		No	No					No	
mIntDemandNetWatts/Value	Interval Demand Net Watts	7855	No	watts	FLOAT	4	No		No	No					No	
mIntDemandNetVARs/Value	Interval Demand Net VARs	7857	No	volt-amperes-reactive	FLOAT	4	No		No	No					No	
mVanPerTHD/Value	Percent THD Van	8154	No	percent	FLOAT	4	No		No	No					No	
mVbnPerTHD/Value	Percent THD Vbn	8156	No	percent	FLOAT	4	No		No	No					No	
mVcnPerTHD/Value	Percent THD Vcn	8158	No	percent	FLOAT	4	No		No	No					No	
mIaPerTHD/Value	Percent THD Ia	9436	No	percent	FLOAT	4	No		No	No					No	
mIbPerTHD/Value	Percent THD Ib	9438	No	percent	FLOAT	4	No		No	No					No	
mIcPerTHD/Value	Percent THD Ic	9440	No	percent	FLOAT	4	No		No	No					No	
mFreq/Value	Frequency	11000	No	hertz	FLOAT	4	No		No	No					No	
mFreqLongtermAvg/Value	Frequency - Long-term Average	11036	No	hertz	FLOAT	4	No		No	No					No	
mLastStartTime/Value	Time of Last Start	12234	No	no-units	DATE	6	No		No	No			ymd-HMS		No	
aRestartPending/Value	A Restart is Pending	3019	Yes											No	No	true; false
mACVAB/.ValueMin	Vab (minimum value)	25100	No	volts	FLOAT	4	No		No	No					No	
mACVAB/.ValueMin	Vab (minimum value) -- Date	25102	No		DATE	6	Yes		No	No			ymd-HMS		No	
mACVAB/.ValueMax	Vab (maximum value)	25105	No	volts	FLOAT	4	No		No	No					No	
mACVAB/.ValueMax	Vab (maximum value) -- Date	25107	No		DATE	6	Yes		No	No			ymd-HMS		No	
mACVBC/.ValueMin	Vbc (minimum value)	25110	No	volts	FLOAT	4	No		No	No					No	
mACVBC/.ValueMin	Vbc (minimum value) -- Date	25112	No		DATE	6	Yes		No	No			ymd-HMS		No	
mACVBC/.ValueMax	Vbc (maximum value)	25115	No	volts	FLOAT	4	No		No	No					No	
mACVBC/.ValueMax	Vbc (maximum value) -- Date	25117	No		DATE	6	Yes		No	No			ymd-HMS		No	
mACVCA/.ValueMin	Vca (minimum value)	25120	No	volts	FLOAT	4	No		No	No					No	
mACVCA/.ValueMin	Vca (minimum value) -- Date	25122	No		DATE	6	Yes		No	No			ymd-HMS		No	
mACVCA/.ValueMax	Vca (maximum value)	25125	No	volts	FLOAT	4	No		No	No					No	
mACVCA/.ValueMax	Vca (maximum value) -- Date	25127	No		DATE	6	Yes		No	No			ymd-HMS		No	
mACVAN/.ValueMin	Van (minimum value)	25130	No	volts	FLOAT	4	No		No	No					No	

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mACVAN/.ValueMin	Van (minimum value) -- Date	25132	No		DATE	6	Yes		No	No			ymd-HMS		No	
mACVAN/.ValueMax	Van (maximum value)	25135	No	volts	FLOAT	4	No		No	No					No	
mACVAN/.ValueMax	Van (maximum value) -- Date	25137	No		DATE	6	Yes		No	No			ymd-HMS		No	
mACVBN/.ValueMin	Vbn (minimum value)	25140	No	volts	FLOAT	4	No		No	No					No	
mACVBN/.ValueMin	Vbn (minimum value) -- Date	25142	No		DATE	6	Yes		No	No			ymd-HMS		No	
mACVBN/.ValueMax	Vbn (maximum value)	25145	No	volts	FLOAT	4	No		No	No					No	
mACVBN/.ValueMax	Vbn (maximum value) -- Date	25147	No		DATE	6	Yes		No	No			ymd-HMS		No	
mACVCN/.ValueMin	Vcn (minimum value)	25150	No	volts	FLOAT	4	No		No	No					No	
mACVCN/.ValueMin	Vcn (minimum value) -- Date	25152	No		DATE	6	Yes		No	No			ymd-HMS		No	
mACVCN/.ValueMax	Vcn (maximum value)	25155	No	volts	FLOAT	4	No		No	No					No	
mACVCN/.ValueMax	Vcn (maximum value) -- Date	25157	No		DATE	6	Yes		No	No			ymd-HMS		No	
mACIAPeakDemand/Value	Demand Ia Peak -- Date	25200	No		DATE	6	Yes		No	No			ymd-HMS		No	
mACIBPeakDemand/Value	Demand Ib Peak -- Date	25203	No		DATE	6	Yes		No	No			ymd-HMS		No	
mACICPeakDemand/Value	Demand Ic Peak -- Date	25206	No		DATE	6	Yes		No	No			ymd-HMS		No	
mDemandInPeak/Value	Demand In Peak -- Date	25209	No		DATE	6	Yes		No	No			ymd-HMS		No	
mPeakDemandAmpsAvg/Value	Peak Demand Amps Avg -- Date	25212	No		DATE	6	Yes		No	No			ymd-HMS		No	
mPeakDemandForwardWatts/Value	Peak Demand Forward Watts -- Date	25215	No		DATE	6	Yes		No	No			ymd-HMS		No	
mPeakDemandReverseWatts/Value	Peak Demand Reverse Watts -- Date	25218	No		DATE	6	Yes		No	No			ymd-HMS		No	
mPeakDemandLaggingVARs/Value	Peak Demand Lagging VARs -- Date	25221	No		DATE	6	Yes		No	No			ymd-HMS		No	
mPeakDemandLeadingVARs/Value	Peak Demand Leading VARs -- Date	25224	No		DATE	6	Yes		No	No			ymd-HMS		No	
mPeakDemandVAs/Value	Peak Demand VAs -- Date	25227	No		DATE	6	Yes		No	No			ymd-HMS		No	
mPeakDemandNetWatts/Value	Peak Demand Net Watts -- Date	25230	No		DATE	6	Yes		No	No			ymd-HMS		No	
mPeakDemandSumWatts/Value	Peak Demand Sum Watts -- Date	25233	No		DATE	6	Yes		No	No			ymd-HMS		No	
mPeakDemandNetVARs/Value	Peak Demand Net VARs -- Date	25236	No		DATE	6	Yes		No	No			ymd-HMS		No	
mPeakDemandSumVARs/Value	Peak Demand Sum VARs -- Date	25239	No		DATE	6	Yes		No	No			ymd-HMS		No	
mVanPerTHD/.ValueMin	Percent THD Van (minimum value)	25300	No	percent	FLOAT	4	No		No	No					No	
mVanPerTHD/.ValueMin	Percent THD Van (minimum value) -- Date	25302	No		DATE	6	Yes		No	No			ymd-HMS		No	
mVanPerTHD/.ValueMax	Percent THD Van (maximum value)	25305	No	percent	FLOAT	4	No		No	No					No	
mVanPerTHD/.ValueMax	Percent THD Van (maximum value) -- Date	25307	No		DATE	6	Yes		No	No			ymd-HMS		No	
mVbnPerTHD/.ValueMin	Percent THD Vbn (minimum value)	25310	No	percent	FLOAT	4	No		No	No					No	
mVbnPerTHD/.ValueMin	Percent THD Vbn (minimum value) -- Date	25312	No		DATE	6	Yes		No	No			ymd-HMS		No	
mVbnPerTHD/.ValueMax	Percent THD Vbn (maximum value)	25315	No	percent	FLOAT	4	No		No	No					No	

Parameter Name	Display Name	Base Address (0-based)	Discrete	Units	Type	Size (bytes)	Is Time-stamp?	Bit Offset	Swap Bytes	Swap Words	Divider	Multiplier	Date Spec	Alarm On False	Writable	Possible Values
mVbnPerTHD/.ValueMax	Percent THD Vbn (maximum value) -- Date	25317	No		DATE	6	Yes		No	No			ymd-HMS		No	
mVcnPerTHD/.ValueMin	Percent THD Vcn (minimum value)	25320	No	percent	FLOAT	4	No		No	No					No	
mVcnPerTHD/.ValueMin	Percent THD Vcn (minimum value) -- Date	25322	No		DATE	6	Yes		No	No			ymd-HMS		No	
mVcnPerTHD/.ValueMax	Percent THD Vcn (maximum value)	25325	No	percent	FLOAT	4	No		No	No					No	
mVcnPerTHD/.ValueMax	Percent THD Vcn (maximum value) -- Date	25327	No		DATE	6	Yes		No	No			ymd-HMS		No	
mIaPerTHD/.ValueMin	Percent THD Ia (minimum value)	25330	No	percent	FLOAT	4	No		No	No					No	
mIaPerTHD/.ValueMin	Percent THD Ia (minimum value) -- Date	25332	No		DATE	6	Yes		No	No			ymd-HMS		No	
mIaPerTHD/.ValueMax	Percent THD Ia (maximum value)	25335	No	percent	FLOAT	4	No		No	No					No	
mIaPerTHD/.ValueMax	Percent THD Ia (maximum value) -- Date	25337	No		DATE	6	Yes		No	No			ymd-HMS		No	
mIbPerTHD/.ValueMin	Percent THD Ib (minimum value)	25340	No	percent	FLOAT	4	No		No	No					No	
mIbPerTHD/.ValueMin	Percent THD Ib (minimum value) -- Date	25342	No		DATE	6	Yes		No	No			ymd-HMS		No	
mIbPerTHD/.ValueMax	Percent THD Ib (maximum value)	25345	No	percent	FLOAT	4	No		No	No					No	
mIbPerTHD/.ValueMax	Percent THD Ib (maximum value) -- Date	25347	No		DATE	6	Yes		No	No			ymd-HMS		No	
mIcPerTHD/.ValueMin	Percent THD Ic (minimum value)	25350	No	percent	FLOAT	4	No		No	No					No	
mIcPerTHD/.ValueMin	Percent THD Ic (minimum value) -- Date	25352	No		DATE	6	Yes		No	No			ymd-HMS		No	
mIcPerTHD/.ValueMax	Percent THD Ic (maximum value)	25355	No	percent	FLOAT	4	No		No	No					No	
mIcPerTHD/.ValueMax	Percent THD Ic (maximum value) -- Date	25357	No		DATE	6	Yes		No	No			ymd-HMS		No	
mFreq/.ValueMin	Frequency (minimum value)	25360	No	hertz	FLOAT	4	No		No	No					No	
mFreq/.ValueMin	Frequency (minimum value) -- Date	25362	No		DATE	6	Yes		No	No			ymd-HMS		No	
mFreq/.ValueMax	Frequency (maximum value)	25365	No	hertz	FLOAT	4	No		No	No					No	
mFreq/.ValueMax	Frequency (maximum value) -- Date	25367	No		DATE	6	Yes		No	No			ymd-HMS		No	
aEventDescr01/Value	Event 1 (Latest)	25400	No		STRING	250	No		No	No					No	
aEventDescr02/Value	Event 2	25525	No		STRING	250	No		No	No					No	
aEventDescr03/Value	Event 3	25650	No		STRING	250	No		No	No					No	
aEventDescr04/Value	Event 4	25775	No		STRING	250	No		No	No					No	
aEventDescr05/Value	Event 5	25900	No		STRING	250	No		No	No					No	
aEventDescr06/Value	Event 6	26025	No		STRING	250	No		No	No					No	
aEventDescr07/Value	Event 7	26150	No		STRING	250	No		No	No					No	
aEventDescr08/Value	Event 8	26275	No		STRING	250	No		No	No					No	
aEventDescr09/Value	Event 9	26400	No		STRING	250	No		No	No					No	
aEventDescr10/Value	Event 10	26525	No		STRING	250	No		No	No					No	

1 mA Output Card Register Map

Parameter Name	Display Name	Base Address (0-based)	Discrete	Units	Type	Size (bytes)	Is Time-stamp	Bit Offset	Swap Bytes	Swap Words	Divider	Multiplier	Date Spec	Alarm On False	Writable	Possible Values
VendorName/Value	Vendor Name	1032	No	no-units	STRING	64	No		No	No					No	
ModelName/Value	Model Name	1064	No	no-units	STRING	64	No		No	No					No	
iDisplayName/Value	Display Name	1096	No	no-units	STRING	64	No		No	No					Yes	
SerialNumber/Value	Serial Number	1276	No	no-units	STRING	64	No		No	No					No	
SoftwareVersion/Value	Software Version	2108	No	no-units	STRING	48	No		No	No					No	
iFieldReplaceableUnit/Value	Field Replaceable Unit	1605	No	no-units	UINT	2	No		No	No					Yes	true; false
mUpdateRate/Value	Update Rate	27600	No	milliseconds	UINT	2	No		No	No					No	
mChannelDirection1/Value	Channel 1 Bidirectional Enable	27601	No	no-units	UINT	2	No		No	No					Yes	Bidirectional; Positive Only
mChannelDirection2/Value	Channel 2 Bidirectional Enable	27602	No	no-units	UINT	2	No		No	No					Yes	Bidirectional; Positive Only
mChannelDirection3/Value	Channel 3 Bidirectional Enable	27603	No	no-units	UINT	2	No		No	No					Yes	Bidirectional; Positive Only
mChannelDirection4/Value	Channel 4 Bidirectional Enable	27604	No	no-units	UINT	2	No		No	No					Yes	Bidirectional; Positive Only
mFormatRegOutput1/Value	Output 1 Format for Limits	27605	No	no-units	UINT	2	No		No	No					No	uint16(1); int16(2); uint32(4); int32(8); float32(16)
mSourceRegOutput1/Value	Source Measure for Output 1	27606	No	no-units	UINT	2	No		No	No					Yes	Not Assigned(0); Van(999); Vbn(1001); Vcn(1003); Vab(1005); Vbc(1007); Vca(1009); Ia(1011); Ib(1013); Ic(1015); Total Watts(1017); Total VARs(1019); Total VA(1021); Total PF(1023); Frequency(1025); In(1027); Watts Phase A(1029); Watts Phase B(1031); Watts Phase C(1033); VARs Phase A(1035); VARs Phase B(1037); VARs Phase C(1039); VA Phase A(1041); VA Phase B(1043); VA Phase C(1045); PF Phase A(1047); PF Phase B(1049); PF Phase C(1051); Demand Ia(1999); Demand Ib(2001); Demand Ic(2003); Demand Forward Watts(2005); Demand Lagging VARs(2007); Demand Reverse Watts(2009); Demand Leading VARs(2011); Demand VAs(2013); Avg Demand Lagging PF(2015); Avg Demand Leading PF(2017); Demand In(2019); Avg Demand Lagging PF Phase A(2051); Avg Demand Lagging PF Phase B(2053); Avg Demand Lagging PF Phase C(2055); Avg Demand Leading PF Phase A(2057); Avg Demand Leading PF Phase B(2059); Avg Demand Leading PF Phase C(2061); THD Van(5999); THD Vbn(6000); THD Vcn(6001); THD Ia(6002); THD Ib(6003); THD Ic(6004)
mHighValueOutput1/Value	Output 1 Source Register High Value	27607	No	no-units	FLOAT	4	No		No	No					Yes	

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mLowValueOutput1/Value	Output 1 Source Register Low Value	27609	No	no-units	FLOAT	4	No		No	No					Yes	
mFormatRegOutput2/Value	Output 2 Format for Limits	27611	No	no-units	UINT	2	No		No	No					No	uint16(1); int16(2); uint32(4); int32(8); float32(16)
mSourceRegOutput2/Value	Source Measure for Output 2	27612	No	no-units	UINT	2	No		No	No					Yes	Not Assigned(0); Van(999); Vbn(1001); Vcn(1003); Vab(1005); Vbc(1007); Vca(1009); Ia(1011); Ib(1013); Ic(1015); Total Watts(1017); Total VARs(1019); Total VA(1021); Total PF(1023); Frequency(1025); In(1027); Watts Phase A(1029); Watts Phase B(1031); Watts Phase C(1033); VARs Phase A(1035); VARs Phase B(1037); VARs Phase C(1039); VA Phase A(1041); VA Phase B(1043); VA Phase C(1045); PF Phase A(1047); PF Phase B(1049); PF Phase C(1051); Demand Ia(1999); Demand Ib(2001); Demand Ic(2003); Demand Forward Watts(2005); Demand Lagging VARs(2007); Demand Reverse Watts(2009); Demand Leading VARs(2011); Demand VAs(2013); Avg Demand Lagging PF(2015); Avg Demand Leading PF(2017); Demand In(2019); Avg Demand Lagging PF Phase A(2051); Avg Demand Lagging PF Phase B(2053); Avg Demand Lagging PF Phase C(2055); Avg Demand Leading PF Phase A(2057); Avg Demand Leading PF Phase B(2059); Avg Demand Leading PF Phase C(2061); THD Van(5999); THD Vbn(6000); THD Vcn(6001); THD Ia(6002); THD Ib(6003); THD Ic(6004)
mHighValueOutput2/Value	Output 2 Source Register High Value	27613	No	no-units	FLOAT	4	No		No	No					Yes	
mLowValueOutput2/Value	Output 2 Source Register Low Value	27615	No	no-units	FLOAT	4	No		No	No					Yes	
mFormatRegOutput3/Value	Output 3 Format for Limits	27617	No	no-units	UINT	2	No		No	No					No	uint16(1); int16(2); uint32(4); int32(8); float32(16)

Parameter Name	Display Name	Base Address (0-based)	Discrete	Units	Type	Size (bytes)	Is Time-stamp	Bit Offset	Swap Bytes	Swap Words	Divider	Multiplier	Date Spec	Alarm On False	Writable	Possible Values
mSourceRegOutput3/Value	Source Measure for Output 3	27618	No	no-units	UINT	2	No		No	No					Yes	Not Assigned(0); Van(999); Vbn(1001); Vcn(1003); Vab(1005); Vbc(1007); Vca(1009); Ia(1011); Ib(1013); Ic(1015); Total Watts(1017); Total VARs(1019); Total VA(1021); Total PF(1023); Frequency(1025); In(1027); Watts Phase A(1029); Watts Phase B(1031); Watts Phase C(1033); VARs Phase A(1035); VARs Phase B(1037); VARs Phase C(1039); VA Phase A(1041); VA Phase B(1043); VA Phase C(1045); PF Phase A(1047); PF Phase B(1049); PF Phase C(1051); Demand Ia(1999); Demand Ib(2001); Demand Ic(2003); Demand Forward Watts(2005); Demand Lagging VARs(2007); Demand Reverse Watts(2009); Demand Leading VARs(2011); Demand VAs(2013); Avg Demand Lagging PF(2015); Avg Demand Leading PF(2017); Demand In(2019); Avg Demand Lagging PF Phase A(2051); Avg Demand Lagging PF Phase B(2053); Avg Demand Lagging PF Phase C(2055); Avg Demand Leading PF Phase A(2057); Avg Demand Leading PF Phase B(2059); Avg Demand Leading PF Phase C(2061); THD Van(5999); THD Vbn(6000); THD Vcn(6001); THD Ia(6002); THD Ib(6003); THD Ic(6004)
mHighValueOutput3/Value	Output 3 Source Register High Value	27619	No	no-units	FLOAT	4	No		No	No					Yes	
mLowValueOutput3/Value	Output 3 Source Register Low Value	27621	No	no-units	FLOAT	4	No		No	No					Yes	
mFormatRegOutput4/Value	Output 4 Format for Limits	27623	No	no-units	UINT	2	No		No	No					No	uint16(1); int16(2); uint32(4); int32(8); float32(16)

Parameter Name	Display Name	Base Address (0-based)	Discrete	Units	Type	Size (bytes)	Is Time-stamp	Bit Offset	Swap Bytes	Swap Words	Divider	Multiplier	Date Spec	Alarm On False	Writable	Possible Values
mSourceRegOutput4/Value	Source Measure for Output 4	27624	No	no-units	UINT	2	No		No	No					Yes	Not Assigned(0); Van(999); Vbn(1001); Vcn(1003); Vab(1005); Vbc(1007); Vca(1009); Ia(1011); Ib(1013); Ic(1015); Total Watts(1017); Total VARs(1019); Total VA(1021); Total PF(1023); Frequency(1025); In(1027); Watts Phase A(1029); Watts Phase B(1031); Watts Phase C(1033); VARs Phase A(1035); VARs Phase B(1037); VARs Phase C(1039); VA Phase A(1041); VA Phase B(1043); VA Phase C(1045); PF Phase A(1047); PF Phase B(1049); PF Phase C(1051); Demand Ia(1999); Demand Ib(2001); Demand Ic(2003); Demand Forward Watts(2005); Demand Lagging VARs(2007); Demand Reverse Watts(2009); Demand Leading VARs(2011); Demand VAs(2013); Avg Demand Lagging PF(2015); Avg Demand Leading PF(2017); Demand In(2019); Avg Demand Lagging PF Phase A(2051); Avg Demand Lagging PF Phase B(2053); Avg Demand Lagging PF Phase C(2055); Avg Demand Leading PF Phase A(2057); Avg Demand Leading PF Phase B(2059); Avg Demand Leading PF Phase C(2061); THD Van(5999); THD Vbn(6000); THD Vcn(6001); THD Ia(6002); THD Ib(6003); THD Ic(6004)
mHighValueOutput4/Value	Output 4 Source Register High Value	27625	No	no-units	FLOAT	4	No		No	No					Yes	
mLowValueOutput4/Value	Output 4 Source Register Low Value	27627	No	no-units	FLOAT	4	No		No	No					Yes	

4-20 mA Output Card Map

Parameter Name	Display Name	Base Address (0-based)	Discrete	Units	Type	Size (bytes)	Is Time-stamp	Bit Offset	Swap Bytes	Swap Words	Divider	Multiplier	Date Spec	Alarm On False	Writable	Possible Values
VendorName/Value	Vendor Name	1032	No	no-units	STRING	64	No		No	No					No	
ModelName/Value	Model Name	1064	No	no-units	STRING	64	No		No	No					No	
iDisplayName/Value	Display Name	1096	No	no-units	STRING	64	No		No	No					Yes	
SerialNumber/Value	Serial Number	1276	No	no-units	STRING	64	No		No	No					No	
SoftwareVersion/Value	Software Version	2108	No	no-units	STRING	48	No		No	No					No	
iFieldReplaceableUnit/Value	Field Replaceable Unit	1605	No	no-units	UINT	2	No		No	No					Yes	true; false
mUpdateRate/Value	Update Rate	27600	No	milliseconds	UINT	2	No		No	No					No	
mFormatRegOutput1/Value	Output 1 Format Parameter	27605	No	no-units	UINT	2	No		No	No					No	uint16(1); int16(2); uint32(4); int32(8); float32(16)

Parameter Name	Display Name	Base Address (0-based)	Discrete	Units	Type	Size (bytes)	Is Time-stamp	Bit Offset	Swap Bytes	Swap Words	Divider	Multiplier	Date Spec	Alarm On False	Writable	Possible Values
mSourceRegOutput1/Value	Source Measure for Output 1	27606	No	no-units	UINT	2	No		No	No					Yes	Not Assigned(0); Van(999); Vbn(1001); Vcn(1003); Vab(1005); Vbc(1007); Vca(1009); Ia(1011); Ib(1013); Ic(1015); Total Watts(1017); Total VARs(1019); Total VA(1021); Total PF(1023); Frequency(1025); In(1027); Watts Phase A(1029); Watts Phase B(1031); Watts Phase C(1033); VARs Phase A(1035); VARs Phase B(1037); VARs Phase C(1039); VA Phase A(1041); VA Phase B(1043); VA Phase C(1045); PF Phase A(1047); PF Phase B(1049); PF Phase C(1051); Demand Ia(1999); Demand Ib(2001); Demand Ic(2003); Demand Forward Watts(2005); Demand Lagging VARs(2007); Demand Reverse Watts(2009); Demand Leading VARs(2011); Demand VAs(2013); Avg Demand Lagging PF(2015); Avg Demand Leading PF(2017); Demand In(2019); Avg Demand Lagging PF Phase A(2051); Avg Demand Lagging PF Phase B(2053); Avg Demand Lagging PF Phase C(2055); Avg Demand Leading PF Phase A(2057); Avg Demand Leading PF Phase B(2059); Avg Demand Leading PF Phase C(2061); THD Van(5999); THD Vbn(6000); THD Vcn(6001); THD Ia(6002); THD Ib(6003); THD Ic(6004)
mHighValueOutput1/Value	Output 1 Source Register High Value	27607	No	no-units	FLOAT	4	No		No	No					Yes	
mLowValueOutput1/Value	Output 1 Source Register Low Value	27609	No	no-units	FLOAT	4	No		No	No					Yes	
mFormatRegOutput2/Value	Output 2 Format Parameter	27611	No	no-units	UINT	2	No		No	No					No	uint16(1); int16(2); uint32(4); int32(8); float32(16)

Parameter Name	Display Name	Base Address (0-based)	Discrete	Units	Type	Size (bytes)	Is Time-stamp	Bit Offset	Swap Bytes	Swap Words	Divider	Multiplier	Date Spec	Alarm On False	Writable	Possible Values
mSourceRegOutput2/Value	Source Measure for Output 2	27612	No	no-units	UINT	2	No		No	No					Yes	Not Assigned(0); Van(999); Vbn(1001); Vcn(1003); Vab(1005); Vbc(1007); Vca(1009); Ia(1011); Ib(1013); Ic(1015); Total Watts(1017); Total VARs(1019); Total VA(1021); Total PF(1023); Frequency(1025); In(1027); Watts Phase A(1029); Watts Phase B(1031); Watts Phase C(1033); VARs Phase A(1035); VARs Phase B(1037); VARs Phase C(1039); VA Phase A(1041); VA Phase B(1043); VA Phase C(1045); PF Phase A(1047); PF Phase B(1049); PF Phase C(1051); Demand Ia(1999); Demand Ib(2001); Demand Ic(2003); Demand Forward Watts(2005); Demand Lagging VARs(2007); Demand Reverse Watts(2009); Demand Leading VARs(2011); Demand VAs(2013); Avg Demand Lagging PF(2015); Avg Demand Leading PF(2017); Demand In(2019); Avg Demand Lagging PF Phase A(2051); Avg Demand Lagging PF Phase B(2053); Avg Demand Lagging PF Phase C(2055); Avg Demand Leading PF Phase A(2057); Avg Demand Leading PF Phase B(2059); Avg Demand Leading PF Phase C(2061); THD Van(5999); THD Vbn(6000); THD Vcn(6001); THD Ia(6002); THD Ib(6003); THD Ic(6004)
mHighValueOutput2/Value	Output 2 Source Register High Value	27613	No	no-units	FLOAT	4	No		No	No					Yes	
mLowValueOutput2/Value	Output 2 Source Register Low Value	27615	No	no-units	FLOAT	4	No		No	No					Yes	
mFormatRegOutput3/Value	Output 3 Format Parameter	27617	No	no-units	UINT	2	No		No	No					No	uint16(1); int16(2); uint32(4); int32(8); float32(16)

Parameter Name	Display Name	Base Address (0-based)	Discrete	Units	Type	Size (bytes)	Is Time-stamp	Bit Offset	Swap Bytes	Swap Words	Divider	Multiplier	Date Spec	Alarm On False	Writable	Possible Values
mSourceRegOutput3/Value	Source Measure for Output 3	27618	No	no-units	UINT	2	No		No	No					Yes	Not Assigned(0); Van(999); Vbn(1001); Vcn(1003); Vab(1005); Vbc(1007); Vca(1009); Ia(1011); Ib(1013); Ic(1015); Total Watts(1017); Total VARs(1019); Total VA(1021); Total PF(1023); Frequency(1025); In(1027); Watts Phase A(1029); Watts Phase B(1031); Watts Phase C(1033); VARs Phase A(1035); VARs Phase B(1037); VARs Phase C(1039); VA Phase A(1041); VA Phase B(1043); VA Phase C(1045); PF Phase A(1047); PF Phase B(1049); PF Phase C(1051); Demand Ia(1999); Demand Ib(2001); Demand Ic(2003); Demand Forward Watts(2005); Demand Lagging VARs(2007); Demand Reverse Watts(2009); Demand Leading VARs(2011); Demand VAs(2013); Avg Demand Lagging PF(2015); Avg Demand Leading PF(2017); Demand In(2019); Avg Demand Lagging PF Phase A(2051); Avg Demand Lagging PF Phase B(2053); Avg Demand Lagging PF Phase C(2055); Avg Demand Leading PF Phase A(2057); Avg Demand Leading PF Phase B(2059); Avg Demand Leading PF Phase C(2061); THD Van(5999); THD Vbn(6000); THD Vcn(6001); THD Ia(6002); THD Ib(6003); THD Ic(6004)
mHighValueOutput3/Value	Output 3 Source Register High Value	27619	No	no-units	FLOAT	4	No		No	No					Yes	
mLowValueOutput3/Value	Output 3 Source Register Low Value	27621	No	no-units	FLOAT	4	No		No	No					Yes	
mFormatRegOutput4/Value	Output 4 Format Parameter	27623	No	no-units	UINT	2	No		No	No					No	uint16(1); int16(2); uint32(4); int32(8); float32(16)

Parameter Name	Display Name	Base Address (0-based)	Discrete	Units	Type	Size (bytes)	Is Time-stamp	Bit Offset	Swap Bytes	Swap Words	Divider	Multiplier	Date Spec	Alarm On False	Writable	Possible Values
mSourceRegOutput4/Value	Source Measure for Output 4	27624	No	no-units	UINT	2	No		No	No					Yes	Not Assigned(0); Van(999); Vbn(1001); Vcn(1003); Vab(1005); Vbc(1007); Vca(1009); Ia(1011); Ib(1013); Ic(1015); Total Watts(1017); Total VARs(1019); Total VA(1021); Total PF(1023); Frequency(1025); In(1027); Watts Phase A(1029); Watts Phase B(1031); Watts Phase C(1033); VARs Phase A(1035); VARs Phase B(1037); VARs Phase C(1039); VA Phase A(1041); VA Phase B(1043); VA Phase C(1045); PF Phase A(1047); PF Phase B(1049); PF Phase C(1051); Demand Ia(1999); Demand Ib(2001); Demand Ic(2003); Demand Forward Watts(2005); Demand Lagging VARs(2007); Demand Reverse Watts(2009); Demand Leading VARs(2011); Demand VAs(2013); Avg Demand Lagging PF(2015); Avg Demand Leading PF(2017); Demand In(2019); Avg Demand Lagging PF Phase A(2051); Avg Demand Lagging PF Phase B(2053); Avg Demand Lagging PF Phase C(2055); Avg Demand Leading PF Phase A(2057); Avg Demand Leading PF Phase B(2059); Avg Demand Leading PF Phase C(2061); THD Van(5999); THD Vbn(6000); THD Vcn(6001); THD Ia(6002); THD Ib(6003); THD Ic(6004)
mHighValueOutput4/Value	Output 4 Source Register High Value	27625	No	no-units	FLOAT	4	No		No	No					Yes	
mLowValueOutput4/Value	Output 4 Source Register Low Value	27627	No	no-units	FLOAT	4	No		No	No					Yes	

Pulse Output (Solid State Relay Contacts) / Digital Input Card Map

Parameter Name	Display Name	Base Address (0-based)	Discrete	Units	Type	Size (bytes)	Is Time-stamp	Bit Offset	Swap Bytes	Swap Words	Divider	Multiplier	Date Spec	Alarm On False	Writable	Possible Values
VendorName/Value	Vendor Name	1032	No	no-units	STRING	64	No		No	No					No	
ModelName/Value	Model Name	1064	No	no-units	STRING	64	No		No	No					No	
iDisplayName/Value	Display Name	1096	No	no-units	STRING	64	No		No	No					Yes	
SerialNumber/Value	Serial Number	1276	No	no-units	STRING	64	No		No	No					No	
SoftwareVersion/Value	Software Version	2108	No	no-units	STRING	48	No		No	No					No	
iFieldReplaceableUnit/Value	Field Replaceable Unit	1605	No	no-units	UINT	2	No		No	No					Yes	true;false
mDI1Accum/Value	Input 1 Accumulator - Scaled	10000	No	no-units	UINT	4	No		No	No					No	
mDI2Accum/Value	Input 2 Accumulator - Scaled	10002	No	no-units	UINT	4	No		No	No					No	

Parameter Name	Display Name	Base Address (0-based)	Discrete	Units	Type	Size (bytes)	Is Time-stamp	Bit Offset	Swap Bytes	Swap Words	Divider	Multiplier	Date Spec	Alarm On False	Writable	Possible Values
mDI3Accum/Value	Input 3 Accumulator - Scaled	10004	No	no-units	UINT	4	No		No	No					No	
mDI4Accum/Value	Input 4 Accumulator - Scaled	10006	No	no-units	UINT	4	No		No	No					No	
mDI5Accum/Value	Output 1 Accumulator - Scaled	10008	No	no-units	UINT	4	No		No	No					No	
mDI6Accum/Value	Output 2 Accumulator - Scaled	10010	No	no-units	UINT	4	No		No	No					No	
mDI7Accum/Value	Output 3 Accumulator - Scaled	10012	No	no-units	UINT	4	No		No	No					No	
mDI8Accum/Value	Output 4 Accumulator - Scaled	10014	No	no-units	UINT	4	No		No	No					No	
mDigitalInput1/Value	Digital Input 1	10283	No	no-units	UINT	2	No		No	No					No	1 High;1 Low
mDigitalInput2/Value	Digital Input 2	10284	No	no-units	UINT	2	No		No	No					No	2 High;2 Low
mDigitalInput3/Value	Digital Input 3	10285	No	no-units	UINT	2	No		No	No					No	3 High;3 Low
mDigitalInput4/Value	Digital Input 4	10286	No	no-units	UINT	2	No		No	No					No	4 High;4 Low
mInput1Label/Value	Input 1 Label	27100	No	no-units	STRING	32	No		No	No					Yes	
mInput2Label/Value	Input 2 Label	27116	No	no-units	STRING	32	No		No	No					Yes	
mInput3Label/Value	Input 3 Label	27132	No	no-units	STRING	32	No		No	No					Yes	
mInput4Label/Value	Input 4 Label	27148	No	no-units	STRING	32	No		No	No					Yes	
iInput1AccumLabel/Value	Input 1 Accumulator Label	27164	No	no-units	STRING	32	No		No	No					Yes	
iInput2AccumLabel/Value	Input 2 Accumulator Label	27180	No	no-units	STRING	32	No		No	No					Yes	
iInput3AccumLabel/Value	Input 3 Accumulator Label	27196	No	no-units	STRING	32	No		No	No					Yes	
iInput4AccumLabel/Value	Input 4 Accumulator Label	27212	No	no-units	STRING	32	No		No	No					Yes	
iInput1LowName/Value	Input 1 Open State Name	27228	No	no-units	STRING	16	No		No	No					Yes	
iInput1HighName/Value	Input 1 Closed State Name	27236	No	no-units	STRING	16	No		No	No					Yes	
iInput2LowName/Value	Input 2 Open State Name	27244	No	no-units	STRING	16	No		No	No					Yes	
iInput2HighName/Value	Input 2 Closed State Name	27252	No	no-units	STRING	16	No		No	No					Yes	
iInput3LowName/Value	Input 3 Open State Name	27260	No	no-units	STRING	16	No		No	No					Yes	
iInput3HighName/Value	Input 3 Closed State Name	27268	No	no-units	STRING	16	No		No	No					Yes	
iInput4LowName/Value	Input 4 Open State Name	27276	No	no-units	STRING	16	No		No	No					Yes	
iInput4HighName/Value	Input 4 Closed State Name	27284	No	no-units	STRING	16	No		No	No					Yes	
iTriggerInput1/Value	Trigger Level for Input 1	27292	No	no-units	UINT	2	No		No	No					Yes	Disabled(0);Open To Close(1);Close To Open(2);Any Transition(3)
iTriggerInput2/Value	Trigger Level for Input 2	27293	No	no-units	UINT	2	No		No	No					Yes	Disabled(0);Open To Close(1);Close To Open(2);Any Transition(3)
iTriggerInput3/Value	Trigger Level for Input 3	27294	No	no-units	UINT	2	No		No	No					Yes	Disabled(0);Open To Close(1);Close To Open(2);Any Transition(3)
iTriggerInput4/Value	Trigger Level for Input 4	27295	No	no-units	UINT	2	No		No	No					Yes	Disabled(0);Open To Close(1);Close To Open(2);Any Transition(3)
iInput1AccumDivisor/Value	Input 1 Accumulator Divisor	27298	No	no-units	UINT	2	No		No	No					Yes	by1(0);by10(1);by100(2);by1000(3);by10000(4);by100000(5);Accumulator Disabled(15)
iInput2AccumDivisor/Value	Input 2 Accumulator Divisor	27299	No	no-units	UINT	2	No		No	No					Yes	by1(0);by10(1);by100(2);by1000(3);by10000(4);by100000(5);Accumulator Disabled(15)
iInput3AccumDivisor/Value	Input 3 Accumulator Divisor	27300	No	no-units	UINT	2	No		No	No					Yes	by1(0);by10(1);by100(2);by1000(3);by10000(4);by100000(5);Accumulator Disabled(15)
iInput4AccumDivisor/Value	Input 4 Accumulator Divisor	27301	No	no-units	UINT	2	No		No	No					Yes	by1(0);by10(1);by100(2);by1000(3);by10000(4);by100000(5);Accumulator Disabled(15)

Parameter Name	Display Name	Base Address (0-based)	Discrete	Units	Type	Size (bytes)	Is Time-stamp	Bit Offset	Swap Bytes	Swap Words	Divider	Multiplier	Date Spec	Alarm On False	Writable	Possible Values
mKtFactorInput1/Value	Input 1 Accumulator Kt	27302	No	no-units	UINT	2	No		No	No					Yes	
mKtFactorInput2/Value	Input 2 Accumulator Kt	27303	No	no-units	UINT	2	No		No	No					Yes	
mKtFactorInput3/Value	Input 3 Accumulator Kt	27304	No	no-units	UINT	2	No		No	No					Yes	
mKtFactorInput4/Value	Input 4 Accumulator Kt	27305	No	no-units	UINT	2	No		No	No					Yes	
mOutput1Label/Value	Output 1 Label	27400	No	no-units	STRING	32	No		No	No					Yes	
mOutput2Label/Value	Output 2 Label	27416	No	no-units	STRING	32	No		No	No					Yes	
mOutput3Label/Value	Output 3 Label	27432	No	no-units	STRING	32	No		No	No					Yes	
mOutput4Label/Value	Output 4 Label	27448	No	no-units	STRING	32	No		No	No					Yes	
iSourcePhaseOutput1/Value	Pulse Output 1 Source Phase	27464	No	no-units	UINT	2	No		No	No					Yes	None(0);Phase A(1);Phase B(2);Phase C(3);All Phases(4);End of Interval(5)
iSourcePhaseOutput2/Value	Pulse Output 2 Source Phase	27465	No	no-units	UINT	2	No		No	No					Yes	None(0);Phase A(1);Phase B(2);Phase C(3);All Phases(4);End of Interval(5)
iSourcePhaseOutput3/Value	Pulse Output 3 Source Phase	27466	No	no-units	UINT	2	No		No	No					Yes	None(0);Phase A(1);Phase B(2);Phase C(3);All Phases(4);End of Interval(5)
iSourcePhaseOutput4/Value	Pulse Output 4 Source Phase	27467	No	no-units	UINT	2	No		No	No					Yes	None(0);Phase A(1);Phase B(2);Phase C(3);All Phases(4);End of Interval(5)
iSourceMeasureOutput1/Value	Pulse Output 1 Source Measure	27468	No	no-units	UINT	2	No		No	No					Yes	None(0);Wh(1);+Wh(2);-Wh(3);VARh(4);+VARh(5);-VARh(6);VAh(7);RecdWh(8);DlvrdWh(9);IndctvVARh(10);CapctvVARh(11)
iSourceMeasureOutput2/Value	Pulse Output 2 Source Measure	27469	No	no-units	UINT	2	No		No	No					Yes	None(0);Wh(1);+Wh(2);-Wh(3);VARh(4);+VARh(5);-VARh(6);VAh(7);RecdWh(8);DlvrdWh(9);IndctvVARh(10);CapctvVARh(11)
iSourceMeasureOutput3/Value	Pulse Output 3 Source Measure	27470	No	no-units	UINT	2	No		No	No					Yes	None(0);Wh(1);+Wh(2);-Wh(3);VARh(4);+VARh(5);-VARh(6);VAh(7);RecdWh(8);DlvrdWh(9);IndctvVARh(10);CapctvVARh(11)
iSourceMeasureOutput4/Value	Pulse Output 4 Source Measure	27471	No	no-units	UINT	2	No		No	No					Yes	None(0);Wh(1);+Wh(2);-Wh(3);VARh(4);+VARh(5);-VARh(6);VAh(7);RecdWh(8);DlvrdWh(9);IndctvVARh(10);CapctvVARh(11)
iOutput1AccumDivisor/Value	Pulse Output 1 Accumulator Divisor	27472	No	no-units	UINT	2	No		No	No					Yes	by1(0);by10(1);by100(2);by1000(3);by10000(4);by100000(5);Accumulator Disabled(15)
iOutput2AccumDivisor/Value	Pulse Output 2 Accumulator Divisor	27473	No	no-units	UINT	2	No		No	No					Yes	by1(0);by10(1);by100(2);by1000(3);by10000(4);by100000(5);Accumulator Disabled(15)
iOutput3AccumDivisor/Value	Pulse Output 3 Accumulator Divisor	27474	No	no-units	UINT	2	No		No	No					Yes	by1(0);by10(1);by100(2);by1000(3);by10000(4);by100000(5);Accumulator Disabled(15)
iOutput4AccumDivisor/Value	Pulse Output 4 Accumulator Divisor	27475	No	no-units	UINT	2	No		No	No					Yes	by1(0);by10(1);by100(2);by1000(3);by10000(4);by100000(5);Accumulator Disabled(15)
mKtFactorOutput1/Value	Pulse Output 1 Kt [Wh/pulse] Factor	27476	No	no-units	UINT	2	No		No	No					Yes	
mKtFactorOutput2/Value	Pulse Output 2 Kt [Wh/pulse] Factor	27477	No	no-units	UINT	2	No		No	No					Yes	
mKtFactorOutput3/Value	Pulse Output 3 Kt [Wh/pulse] Factor	27478	No	no-units	UINT	2	No		No	No					Yes	

Parameter Name	Display Name	Base Address (0-based)	Discrete	Units	Type	Size (bytes)	Is Time-stamp	Bit Offset	Swap Bytes	Swap Words	Divider	Multiplier	Date Spec	Alarm On False	Writable	Possible Values
mKtFactorOutput4/Value	Pulse Output 4 Kt [Wh/pulse] Factor	27479	No	no-units	UINT	2	No		No	No					Yes	

Digital Output (Relay Contact) / Digital Input Card Map

Parameter Name	Display Name	Base Address (0-based)	Discrete	Units	Type	Size (bytes)	Is Time-stamp	Bit Offset	Swap Bytes	Swap Words	Divider	Multiplier	Date Spec	Alarm On False	Writable	Possible Values
VendorName/Value	Vendor Name	1032	No	no-units	STRING	64	No		No	No					No	
ModelName/Value	Model Name	1064	No	no-units	STRING	64	No		No	No					No	
iDisplayName/Value	Display Name	1096	No	no-units	STRING	64	No		No	No					Yes	
SerialNumber/Value	Serial Number	1276	No	no-units	STRING	64	No		No	No					No	
SoftwareVersion/Value	Software Version	2108	No	no-units	STRING	48	No		No	No					No	
iFieldReplaceableUnit/Value	Field Replaceable Unit	1605	No	no-units	UINT	2	No		No	No					Yes	true; false
mDI1Accum/Value	Input 1 Accumulator - Scaled	10000	No	no-units	UINT	4	No		No	No					No	
mDI2Accum/Value	Input 2 Accumulator - Scaled	10002	No	no-units	UINT	4	No		No	No					No	
mRelay1/Value	Relay 1	10262	No	no-units	UINT	2	No		No	No					No	Closed; Open
mRelay2/Value	Relay 2	10263	No	no-units	UINT	2	No		No	No					No	Closed; Open
mDigitalInput1/Value	Digital Input 1	10283	No	no-units	UINT	2	No		No	No					No	Closed; Open
mDigitalInput2/Value	Digital Input 2	10284	No	no-units	UINT	2	No		No	No					No	Closed; Open

Parameter Name	Display Name	Base Address (0-based)	Discrete	Units	Type	Size (bytes)	Is Time-stamp	Bit Offset	Swap Bytes	Swap Words	Divider	Multiplier	Date Spec	Alarm On False	Writable	Possible Values
iHWLimitIdent01/Value	Limit ID #1	27000	No	no-units	UINT	2	No		No	No					Yes	Not Assigned(0); Van(999); Vbn(1001); Vcn(1003); Vab(1005); Vbc(1007); Vca(1009); Ia(1011); Ib(1013); Ic(1015); Total Watts(1017); Total VARs(1019); Total VA(1021); Total PF(1023); Frequency(1025); In(1027); Watts Phase A(1029); Watts Phase B(1031); Watts Phase C(1033); VARs Phase A(1035); VARs Phase B(1037); VARs Phase C(1039); VA Phase A(1041); VA Phase B(1043); VA Phase C(1045); PF Phase A(1047); PF Phase B(1049); PF Phase C(1051); Demand Ia(1999); Demand Ib(2001); Demand Ic(2003); Demand Forward Watts(2005); Demand Lagging VARs(2007); Demand Reverse Watts(2009); Demand Leading VARs(2011); Demand VAs(2013); Avg Demand Lagging PF(2015); Avg Demand Leading PF(2017); Demand In(2019); Avg Demand Lagging PF Phase A(2051); Avg Demand Lagging PF Phase B(2053); Avg Demand Lagging PF Phase C(2055); Avg Demand Leading PF Phase A(2057); Avg Demand Leading PF Phase B(2059); Avg Demand Leading PF Phase C(2061); THD Van(5999); THD Vbn(6000); THD Vcn(6001); THD Ia(6002); THD Ib(6003); THD Ic(6004)
iHWLimitAboveSetpoint01/Value	Limit #1 Above Setpoint	27001	No	percent	FLOAT	4	No		No	No					Yes	
iHWLimitAboveRetHyst01/Value	Limit #1 Above Return Hysteresis	27003	No	percent	FLOAT	4	No		No	No					Yes	
iHWLimitBelowSetpoint01/Value	Limit #1 Below Setpoint	27005	No	percent	FLOAT	4	No		No	No					Yes	
iHWLimitBelowRetHyst01/Value	Limit #1 Below Return Hysteresis	27007	No	percent	FLOAT	4	No		No	No					Yes	

Parameter Name	Display Name	Base Address (0-based)	Discrete	Units	Type	Size (bytes)	Is Time-stamp	Bit Offset	Swap Bytes	Swap Words	Divider	Multiplier	Date Spec	Alarm On False	Writable	Possible Values
iHWLimitIdent02/Value	Limit ID #2	27009	No	no-units	UINT	2	No		No	No					Yes	Not Assigned(0); Van(999); Vbn(1001); Vcn(1003); Vab(1005); Vbc(1007); Vca(1009); Ia(1011); Ib(1013); Ic(1015); Total Watts(1017); Total VARs(1019); Total VA(1021); Total PF(1023); Frequency(1025); In(1027); Watts Phase A(1029); Watts Phase B(1031); Watts Phase C(1033); VARs Phase A(1035); VARs Phase B(1037); VARs Phase C(1039); VA Phase A(1041); VA Phase B(1043); VA Phase C(1045); PF Phase A(1047); PF Phase B(1049); PF Phase C(1051); Demand Ia(1999); Demand Ib(2001); Demand Ic(2003); Demand Forward Watts(2005); Demand Lagging VARs(2007); Demand Reverse Watts(2009); Demand Leading VARs(2011); Demand VAs(2013); Avg Demand Lagging PF(2015); Avg Demand Leading PF(2017); Demand In(2019); Avg Demand Lagging PF Phase A(2051); Avg Demand Lagging PF Phase B(2053); Avg Demand Lagging PF Phase C(2055); Avg Demand Leading PF Phase A(2057); Avg Demand Leading PF Phase B(2059); Avg Demand Leading PF Phase C(2061); THD Van(5999); THD Vbn(6000); THD Vcn(6001); THD Ia(6002); THD Ib(6003); THD Ic(6004)
iHWLimitAboveSetpoint02/Value	Limit #2 Above Setpoint	27010	No	percent	FLOAT	4	No		No	No					Yes	
iHWLimitAboveRetHyst02/Value	Limit #2 Above Return Hysteresis	27012	No	percent	FLOAT	4	No		No	No					Yes	
iHWLimitBelowSetpoint02/Value	Limit #2 Below Setpoint	27014	No	percent	FLOAT	4	No		No	No					Yes	
iHWLimitBelowRetHyst02/Value	Limit #2 Below Return Hysteresis	27016	No	percent	FLOAT	4	No		No	No					Yes	

Parameter Name	Display Name	Base Address (0-based)	Discrete	Units	Type	Size (bytes)	Is Time-stamp	Bit Offset	Swap Bytes	Swap Words	Divider	Multiplier	Date Spec	Alarm On False	Writable	Possible Values
iHWLimitIdent03/Value	Limit ID #3	27018	No	no-units	UINT	2	No		No	No					Yes	Not Assigned(0); Van(999); Vbn(1001); Vcn(1003); Vab(1005); Vbc(1007); Vca(1009); Ia(1011); Ib(1013); Ic(1015); Total Watts(1017); Total VARs(1019); Total VA(1021); Total PF(1023); Frequency(1025); In(1027); Watts Phase A(1029); Watts Phase B(1031); Watts Phase C(1033); VARs Phase A(1035); VARs Phase B(1037); VARs Phase C(1039); VA Phase A(1041); VA Phase B(1043); VA Phase C(1045); PF Phase A(1047); PF Phase B(1049); PF Phase C(1051); Demand Ia(1999); Demand Ib(2001); Demand Ic(2003); Demand Forward Watts(2005); Demand Lagging VARs(2007); Demand Reverse Watts(2009); Demand Leading VARs(2011); Demand VAs(2013); Avg Demand Lagging PF(2015); Avg Demand Leading PF(2017); Demand In(2019); Avg Demand Lagging PF Phase A(2051); Avg Demand Lagging PF Phase B(2053); Avg Demand Lagging PF Phase C(2055); Avg Demand Leading PF Phase A(2057); Avg Demand Leading PF Phase B(2059); Avg Demand Leading PF Phase C(2061); THD Van(5999); THD Vbn(6000); THD Vcn(6001); THD Ia(6002); THD Ib(6003); THD Ic(6004)
iHWLimitAboveSetpoint03/Value	Limit #3 Above Setpoint	27019	No	percent	FLOAT	4	No		No	No					Yes	
iHWLimitAboveRetHyst03/Value	Limit #3 Above Return Hysteresis	27021	No	percent	FLOAT	4	No		No	No					Yes	
iHWLimitBelowSetpoint03/Value	Limit #3 Below Setpoint	27023	No	percent	FLOAT	4	No		No	No					Yes	
iHWLimitBelowRetHyst03/Value	Limit #3 Below Return Hysteresis	27025	No	percent	FLOAT	4	No		No	No					Yes	

Parameter Name	Display Name	Base Address (0-based)	Discrete	Units	Type	Size (bytes)	Is Time-stamp	Bit Offset	Swap Bytes	Swap Words	Divider	Multiplier	Date Spec	Alarm On False	Writable	Possible Values
iHWLimitIdent04/Value	Limit ID #4	27027	No	no-units	UINT	2	No		No	No					Yes	Not Assigned(0); Van(999); Vbn(1001); Vcn(1003); Vab(1005); Vbc(1007); Vca(1009); Ia(1011); Ib(1013); Ic(1015); Total Watts(1017); Total VARs(1019); Total VA(1021); Total PF(1023); Frequency(1025); In(1027); Watts Phase A(1029); Watts Phase B(1031); Watts Phase C(1033); VARs Phase A(1035); VARs Phase B(1037); VARs Phase C(1039); VA Phase A(1041); VA Phase B(1043); VA Phase C(1045); PF Phase A(1047); PF Phase B(1049); PF Phase C(1051); Demand Ia(1999); Demand Ib(2001); Demand Ic(2003); Demand Forward Watts(2005); Demand Lagging VARs(2007); Demand Reverse Watts(2009); Demand Leading VARs(2011); Demand VAs(2013); Avg Demand Lagging PF(2015); Avg Demand Leading PF(2017); Demand In(2019); Avg Demand Lagging PF Phase A(2051); Avg Demand Lagging PF Phase B(2053); Avg Demand Lagging PF Phase C(2055); Avg Demand Leading PF Phase A(2057); Avg Demand Leading PF Phase B(2059); Avg Demand Leading PF Phase C(2061); THD Van(5999); THD Vbn(6000); THD Vcn(6001); THD Ia(6002); THD Ib(6003); THD Ic(6004)
iHWLimitAboveSetpoint04/Value	Limit #4 Above Setpoint	27028	No	percent	FLOAT	4	No		No	No					Yes	
iHWLimitAboveRetHyst04/Value	Limit #4 Above Return Hysteresis	27030	No	percent	FLOAT	4	No		No	No					Yes	
iHWLimitBelowSetpoint04/Value	Limit #4 Below Setpoint	27032	No	percent	FLOAT	4	No		No	No					Yes	
iHWLimitBelowRetHyst04/Value	Limit #4 Below Return Hysteresis	27034	No	percent	FLOAT	4	No		No	No					Yes	

Parameter Name	Display Name	Base Address (0-based)	Discrete	Units	Type	Size (bytes)	Is Time-stamp	Bit Offset	Swap Bytes	Swap Words	Divider	Multiplier	Date Spec	Alarm On False	Writable	Possible Values
iHWLimitIdent05/Value	Limit ID #5	27036	No	no-units	UINT	2	No		No	No					Yes	Not Assigned(0); Van(999); Vbn(1001); Vcn(1003); Vab(1005); Vbc(1007); Vca(1009); Ia(1011); Ib(1013); Ic(1015); Total Watts(1017); Total VARs(1019); Total VA(1021); Total PF(1023); Frequency(1025); In(1027); Watts Phase A(1029); Watts Phase B(1031); Watts Phase C(1033); VARs Phase A(1035); VARs Phase B(1037); VARs Phase C(1039); VA Phase A(1041); VA Phase B(1043); VA Phase C(1045); PF Phase A(1047); PF Phase B(1049); PF Phase C(1051); Demand Ia(1999); Demand Ib(2001); Demand Ic(2003); Demand Forward Watts(2005); Demand Lagging VARs(2007); Demand Reverse Watts(2009); Demand Leading VARs(2011); Demand VAs(2013); Avg Demand Lagging PF(2015); Avg Demand Leading PF(2017); Demand In(2019); Avg Demand Lagging PF Phase A(2051); Avg Demand Lagging PF Phase B(2053); Avg Demand Lagging PF Phase C(2055); Avg Demand Leading PF Phase A(2057); Avg Demand Leading PF Phase B(2059); Avg Demand Leading PF Phase C(2061); THD Van(5999); THD Vbn(6000); THD Vcn(6001); THD Ia(6002); THD Ib(6003); THD Ic(6004)
iHWLimitAboveSetpoint05/Value	Limit #5 Above Setpoint	27037	No	percent	FLOAT	4	No		No	No					Yes	
iHWLimitAboveRetHyst05/Value	Limit #5 Above Return Hysteresis	27039	No	percent	FLOAT	4	No		No	No					Yes	
iHWLimitBelowSetpoint05/Value	Limit #5 Below Setpoint	27041	No	percent	FLOAT	4	No		No	No					Yes	
iHWLimitBelowRetHyst05/Value	Limit #5 Below Return Hysteresis	27043	No	percent	FLOAT	4	No		No	No					Yes	

Parameter Name	Display Name	Base Address (0-based)	Discrete	Units	Type	Size (bytes)	Is Time-stamp	Bit Offset	Swap Bytes	Swap Words	Divider	Multiplier	Date Spec	Alarm On False	Writable	Possible Values
iHWLimitIdent06/Value	Limit ID #6	27045	No	no-units	UINT	2	No		No	No					Yes	Not Assigned(0); Van(999); Vbn(1001); Vcn(1003); Vab(1005); Vbc(1007); Vca(1009); Ia(1011); Ib(1013); Ic(1015); Total Watts(1017); Total VARs(1019); Total VA(1021); Total PF(1023); Frequency(1025); In(1027); Watts Phase A(1029); Watts Phase B(1031); Watts Phase C(1033); VARs Phase A(1035); VARs Phase B(1037); VARs Phase C(1039); VA Phase A(1041); VA Phase B(1043); VA Phase C(1045); PF Phase A(1047); PF Phase B(1049); PF Phase C(1051); Demand Ia(1999); Demand Ib(2001); Demand Ic(2003); Demand Forward Watts(2005); Demand Lagging VARs(2007); Demand Reverse Watts(2009); Demand Leading VARs(2011); Demand VAs(2013); Avg Demand Lagging PF(2015); Avg Demand Leading PF(2017); Demand In(2019); Avg Demand Lagging PF Phase A(2051); Avg Demand Lagging PF Phase B(2053); Avg Demand Lagging PF Phase C(2055); Avg Demand Leading PF Phase A(2057); Avg Demand Leading PF Phase B(2059); Avg Demand Leading PF Phase C(2061); THD Van(5999); THD Vbn(6000); THD Vcn(6001); THD Ia(6002); THD Ib(6003); THD Ic(6004)
iHWLimitAboveSetpoint06/Value	Limit #6 Above Setpoint	27046	No	percent	FLOAT	4	No		No	No					Yes	
iHWLimitAboveRetHyst06/Value	Limit #6 Above Return Hysteresis	27048	No	percent	FLOAT	4	No		No	No					Yes	
iHWLimitBelowSetpoint06/Value	Limit #6 Below Setpoint	27050	No	percent	FLOAT	4	No		No	No					Yes	
iHWLimitBelowRetHyst06/Value	Limit #6 Below Return Hysteresis	27052	No	percent	FLOAT	4	No		No	No					Yes	

Parameter Name	Display Name	Base Address (0-based)	Discrete	Units	Type	Size (bytes)	Is Time-stamp	Bit Offset	Swap Bytes	Swap Words	Divider	Multiplier	Date Spec	Alarm On False	Writable	Possible Values
iHWLimitIdent07/Value	Limit ID #7	27054	No	no-units	UINT	2	No		No	No					Yes	Not Assigned(0); Van(999); Vbn(1001); Vcn(1003); Vab(1005); Vbc(1007); Vca(1009); Ia(1011); Ib(1013); Ic(1015); Total Watts(1017); Total VARs(1019); Total VA(1021); Total PF(1023); Frequency(1025); In(1027); Watts Phase A(1029); Watts Phase B(1031); Watts Phase C(1033); VARs Phase A(1035); VARs Phase B(1037); VARs Phase C(1039); VA Phase A(1041); VA Phase B(1043); VA Phase C(1045); PF Phase A(1047); PF Phase B(1049); PF Phase C(1051); Demand Ia(1999); Demand Ib(2001); Demand Ic(2003); Demand Forward Watts(2005); Demand Lagging VARs(2007); Demand Reverse Watts(2009); Demand Leading VARs(2011); Demand VAs(2013); Avg Demand Lagging PF(2015); Avg Demand Leading PF(2017); Demand In(2019); Avg Demand Lagging PF Phase A(2051); Avg Demand Lagging PF Phase B(2053); Avg Demand Lagging PF Phase C(2055); Avg Demand Leading PF Phase A(2057); Avg Demand Leading PF Phase B(2059); Avg Demand Leading PF Phase C(2061); THD Van(5999); THD Vbn(6000); THD Vcn(6001); THD Ia(6002); THD Ib(6003); THD Ic(6004)
iHWLimitAboveSetpoint07/Value	Limit #7 Above Setpoint	27055	No	percent	FLOAT	4	No		No	No					Yes	
iHWLimitAboveRetHyst07/Value	Limit #7 Above Return Hysteresis	27057	No	percent	FLOAT	4	No		No	No					Yes	
iHWLimitBelowSetpoint07/Value	Limit #7 Below Setpoint	27059	No	percent	FLOAT	4	No		No	No					Yes	
iHWLimitBelowRetHyst07/Value	Limit #7 Below Return Hysteresis	27061	No	percent	FLOAT	4	No		No	No					Yes	

Parameter Name	Display Name	Base Address (0-based)	Discrete	Units	Type	Size (bytes)	Is Time-stamp	Bit Offset	Swap Bytes	Swap Words	Divider	Multiplier	Date Spec	Alarm On False	Writable	Possible Values
iHWLimitIdent08/Value	Limit ID #8	27063	No	no-units	UINT	2	No		No	No					Yes	Not Assigned(0); Van(999); Vbn(1001); Vcn(1003); Vab(1005); Vbc(1007); Vca(1009); Ia(1011); Ib(1013); Ic(1015); Total Watts(1017); Total VARs(1019); Total VA(1021); Total PF(1023); Frequency(1025); In(1027); Watts Phase A(1029); Watts Phase B(1031); Watts Phase C(1033); VARs Phase A(1035); VARs Phase B(1037); VARs Phase C(1039); VA Phase A(1041); VA Phase B(1043); VA Phase C(1045); PF Phase A(1047); PF Phase B(1049); PF Phase C(1051); Demand Ia(1999); Demand Ib(2001); Demand Ic(2003); Demand Forward Watts(2005); Demand Lagging VARs(2007); Demand Reverse Watts(2009); Demand Leading VARs(2011); Demand VAs(2013); Avg Demand Lagging PF(2015); Avg Demand Leading PF(2017); Demand In(2019); Avg Demand Lagging PF Phase A(2051); Avg Demand Lagging PF Phase B(2053); Avg Demand Lagging PF Phase C(2055); Avg Demand Leading PF Phase A(2057); Avg Demand Leading PF Phase B(2059); Avg Demand Leading PF Phase C(2061); THD Van(5999); THD Vbn(6000); THD Vcn(6001); THD Ia(6002); THD Ib(6003); THD Ic(6004)
iHWLimitAboveSetpoint08/Value	Limit #8 Above Setpoint	27064	No	percent	FLOAT	4	No		No	No					Yes	
iHWLimitAboveRetHyst08/Value	Limit #8 Above Return Hysteresis	27066	No	percent	FLOAT	4	No		No	No					Yes	
iHWLimitBelowSetpoint08/Value	Limit #8 Below Setpoint	27068	No	percent	FLOAT	4	No		No	No					Yes	
iHWLimitBelowRetHyst08/Value	Limit #8 Below Return Hysteresis	27070	No	percent	FLOAT	4	No		No	No					Yes	
mInput1Label/Value	Input 1 Label	27100	No	no-units	STRING	32	No		No	No					Yes	
mInput2Label/Value	Input 2 Label	27116	No	no-units	STRING	32	No		No	No					Yes	
iInput1AccumLabel/Value	Input 1 Accumulator Label	27164	No	no-units	STRING	32	No		No	No					Yes	
iInput2AccumLabel/Value	Input 2 Accumulator Label	27180	No	no-units	STRING	32	No		No	No					Yes	
iInput1LowName/Value	Input 1 Open State Name	27228	No	no-units	STRING	16	No		No	No					Yes	
iInput1HighName/Value	Input 1 Closed State Name	27236	No	no-units	STRING	16	No		No	No					Yes	
iInput2LowName/Value	Input 2 Open State Name	27244	No	no-units	STRING	16	No		No	No					Yes	

Parameter Name	Display Name	Base Address (0-based)	Discrete	Units	Type	Size (bytes)	Is Time-stamp	Bit Offset	Swap Bytes	Swap Words	Divider	Multiplier	Date Spec	Alarm On False	Writable	Possible Values
iInput2HighName/Value	Input 2 Closed State Name	27252	No	no-units	STRING	16	No		No	No					Yes	
iTriggerInput1/Value	Trigger Level for Input 1	27292	No	no-units	UINT	2	No		No	No					Yes	Disabled(0); Open To Close(1); Close To Open(2); Any Transition(3)
iTriggerInput2/Value	Trigger Level for Input 2	27293	No	no-units	UINT	2	No		No	No					Yes	Disabled(0); Open To Close(1); Close To Open(2); Any Transition(3)
iEOIEnableInput1/Value	Select Input 1 as End of Interval	27296	No	no-units	UINT	2	No		No	No					Yes	Enabled; Disabled
iEOIEnableInput2/Value	Select Input 2 as End of Interval	27297	No	no-units	UINT	2	No		No	No					Yes	Enabled; Disabled
iInput1AccumDivisor/Value	Input 1 Accumulator Divisor	27298	No	no-units	UINT	2	No		No	No					Yes	by1(0); by10(1); by100(2); by1000(3); by10000(4); by100000(5); Accumulator Disabled(15)
iInput2AccumDivisor/Value	Input 2 Accumulator Divisor	27299	No	no-units	UINT	2	No		No	No					Yes	by1(0); by10(1); by100(2); by1000(3); by10000(4); by100000(5); Accumulator Disabled(15)
mKtFactorInput1/Value	Input 1 Accumulator Kt	27302	No	no-units	UINT	2	No		No	No					Yes	
mKtFactorInput2/Value	Input 2 Accumulator Kt	27303	No	no-units	UINT	2	No		No	No					Yes	
mRelay1Label/Value	Relay 1 Label	27480	No	no-units	STRING	32	No		No	No					Yes	
mRelay2Label/Value	Relay 2 Label	27496	No	no-units	STRING	32	No		No	No					Yes	
iRelay1OpenName/Value	Relay 1 Open State Name	27512	No	no-units	STRING	32	No		No	No					Yes	
iRelay1ClosedName/Value	Relay 1 Closed State Name	27528	No	no-units	STRING	32	No		No	No					Yes	
iRelay2OpenName/Value	Relay 2 Open State Name	27544	No	no-units	STRING	32	No		No	No					Yes	
iRelay2ClosedName/Value	Relay 2 Closed State Name	27560	No	no-units	STRING	32	No		No	No					Yes	
mRelay1Accum/Value	Relay 1 Accumulator - Scaled	27576	No	no-units	UINT	2	No		No	No					No	
mRelay2Accum/Value	Relay 2 Accumulator - Scaled	27577	No	no-units	UINT	2	No		No	No					No	
mRelay1OperateDelay/Value	Relay 1 Delay to Operate	27582	No	tenth-seconds	UINT	2	No		No	No					Yes	
mRelay1ReleaseDelay/Value	Relay 1 Delay to Release	27583	No	tenth-seconds	UINT	2	No		No	No					Yes	
mRelay2OperateDelay/Value	Relay 2 Delay to Operate	27584	No	tenth-seconds	UINT	2	No		No	No					Yes	
mRelay2ReleaseDelay/Value	Relay 2 Delay to Release	27585	No	tenth-seconds	UINT	2	No		No	No					Yes	
iRelay1AccumDivisor/Value	Relay 1 Accumulator Divisor	27586	No	no-units	UINT	2	No		No	No					Yes	by1(0); by10(1); by100(2); by1000(3); by10000(4); by100000(5); Accumulator Disabled(15)
iRelay2AccumDivisor/Value	Relay 2 Accumulator Divisor	27587	No	no-units	UINT	2	No		No	No					Yes	by1(0); by10(1); by100(2); by1000(3); by10000(4); by100000(5); Accumulator Disabled(15)

RTU (RS485) Map

The following is a complete Modbus map, including option cards, for communications through the RS485 port.

Modbus Address Hex	Modbus Address Decimal	Description[1]	Format	Range6	Units or Resolution	Comments	# Reg
		Fixed Data Section					
Identification Block						read-only	
0000 - 0007	1 - 8	Reserved	ASCII	16 char	none	Reserved	8
0008 - 000F	9 - 16	Meter Serial Number	ASCII	16 char	none		8
0010 - 0010	17 - 17	Meter Type	UINT16	bit-mapped	-------t vvvvvvvv	t = transducer model (1=yes, 0=no), vvv = Model: V43 = PXM2250 V44 = PXM2260 V45 = PXM2270	1
0011 - 0012	18 - 19	Firmware Version	ASCII	4 char	none		2
0013 - 0013	20 - 20	Map Version	UINT16	0 to 65535	none		1
0014 - 0014	21 - 21	Meter Configuration	UINT16	bit-mapped	-----ccc --ffffff	ccc = CT denominator (1 or 5), ffffff = calibration frequency (50 or 60)	1
0015 - 0015	22 - 22	ASIC Version	UINT16	0-65535	none		1
0016 - 0017	23 - 24	Boot Firmware Version	ASCII	4 char	none		2
0018 - 0018	25 - 25	Option Slot 1 Usage	UINT16	bit-mapped	same as register 10000 (0x270F)		1
0019 - 0019	26 - 26	Option Slot 2 Usage	UINT16	bit-mapped	same as register 11000 (0x2AF7)		1
001A - 001D	27 - 30	Meter Type Name	ASCII	8 char	none		4
001E - 0026	31 - 39	Reserved				Reserved	9
0027 - 002E	40 - 47	Reserved				Reserved	8
						Block Size:	47
		Meter Data Section[2]					
Primary Readings Block						read-only	
03E7 - 03E8	1000 - 1001	Volts A-N	FLOAT	0 to 9999 M	volts		2
03E9 - 03EA	1002 - 1003	Volts B-N	FLOAT	0 to 9999 M	volts		2
03EB - 03EC	1004 - 1005	Volts C-N	FLOAT	0 to 9999 M	volts		2

03ED - 03EE	1006 - 1007	Volts A-B	FLOAT	0 to 9999 M	volts			2
03EF - 03F0	1008 - 1009	Volts B-C	FLOAT	0 to 9999 M	volts			2
03F1 - 03F2	1010 - 1011	Volts C-A	FLOAT	0 to 9999 M	volts			2
03F3 - 03F4	1012 - 1013	Amps A	FLOAT	0 to 9999 M	amps			2
03F5 - 03F6	1014 - 1015	Amps B	FLOAT	0 to 9999 M	amps			2
03F7 - 03F8	1016 - 1017	Amps C	FLOAT	0 to 9999 M	amps			2
03F9 - 03FA	1018 - 1019	Watts, 3-Ph total	FLOAT	-9999 M to +9999 M	watts			2
03FB - 03FC	1020 - 1021	VARs, 3-Ph total	FLOAT	-9999 M to +9999 M	VARs			2
03FD - 03FE	1022 - 1023	VAs, 3-Ph total	FLOAT	-9999 M to +9999 M	VAs			2
03FF - 0400	1024 - 1025	Power Factor, 3-Ph total	FLOAT	-1.00 to +1.00	none			2
0401 - 0402	1026 - 1027	Frequency	FLOAT	0 to 65.00	Hz			2
0403 - 0404	1028 - 1029	Neutral Current	FLOAT	0 to 9999 M	amps			2
0405 - 0406	1030 - 1031	Watts, Phase A	FLOAT	-9999 M to +9999 M	watts			2
0407 - 0408	1032 - 1033	Watts, Phase B	FLOAT	-9999 M to +9999 M	watts			2
0409 - 040A	1034 - 1035	Watts, Phase C	FLOAT	-9999 M to +9999 M	watts			2
040B - 040C	1036 - 1037	VARs, Phase A	FLOAT	-9999 M to +9999 M	VARs			2
040D - 040E	1038 - 1039	VARs, Phase B	FLOAT	-9999 M to +9999 M	VARs			2
040F - 0410	1040 - 1041	VARs, Phase C	FLOAT	-9999 M to +9999 M	VARs			2
0411 - 0412	1042 - 1043	VAs, Phase A	FLOAT	-9999 M to +9999 M	VAs			2
0413 - 0414	1044 - 1045	VAs, Phase B	FLOAT	-9999 M to +9999 M	VAs			2
0415 - 0416	1046 - 1047	VAs, Phase C	FLOAT	-9999 M to +9999 M	VAs			2
0417 - 0418	1048 - 1049	Power Factor, Phase A	FLOAT	-1.00 to +1.00	none			2
0419 - 041A	1050 - 1051	Power Factor, Phase B	FLOAT	-1.00 to +1.00	none			2
041B - 041C	1052 - 1053	Power Factor, Phase C	FLOAT	-1.00 to +1.00	none			2
041D - 0425	1054 - 1062	Reserved				Reserved		9
							Block Size:	63

Primary Energy Block										read-only	
05DB	-	05DC	1500	-	1501	W-hours, Received	SINT32	0 to 99999999 or 0 to -99999999	Wh per energy format	* Wh received & delivered always have opposite signs * Wh received is positive for "view as load", delivered is positive for "view as generator" * 5 to 8 digits * decimal point implied, per energy format * resolution of digit before decimal point = units, kilo, or mega, per energy format * see note 10	2
05DD	-	05DE	1502	-	1503	W-hours, Delivered	SINT32	0 to 99999999 or 0 to -99999999	Wh per energy format		2
05DF	-	05E0	1504	-	1505	W-hours, Net	SINT32	-99999999 to 99999999	Wh per energy format		2
05E1	-	05E2	1506	-	1507	W-hours, Total	SINT32	0 to 99999999	Wh per energy format		2
05E3	-	05E4	1508	-	1509	VAR-hours, Positive	SINT32	0 to 99999999	VARh per energy format		2
05E5	-	05E6	1510	-	1511	VAR-hours, Negative	SINT32	0 to -99999999	VARh per energy format		2
05E7	-	05E8	1512	-	1513	VAR-hours, Net	SINT32	-99999999 to 99999999	VARh per energy format		2
05E9	-	05EA	1514	-	1515	VAR-hours, Total	SINT32	0 to 99999999	VARh per energy format		2
05EB	-	05EC	1516	-	1517	VA-hours, Total	SINT32	0 to 99999999	VAh per energy format		2
05ED	-	05EE	1518	-	1519	W-hours, Received, Phase A	SINT32	0 to 99999999 or 0 to -99999999	Wh per energy format		2
05EF	-	05F0	1520	-	1521	W-hours, Received, Phase B	SINT32	0 to 99999999 or 0 to -99999999	Wh per energy format		2
05F1	-	05F2	1522	-	1523	W-hours, Received, Phase C	SINT32	0 to 99999999 or 0 to -99999999	Wh per energy format		2
05F3	-	05F4	1524	-	1525	W-hours, Delivered, Phase A	SINT32	0 to 99999999 or 0 to -99999999	Wh per energy format		2
05F5	-	05F6	1526	-	1527	W-hours, Delivered, Phase B	SINT32	0 to 99999999 or 0 to -99999999	Wh per energy format		2
05F7	-	05F8	1528	-	1529	W-hours, Delivered, Phase C	SINT32	0 to 99999999 or 0 to -99999999	Wh per energy format		2
05F9	-	05FA	1530	-	1531	W-hours, Net, Phase A	SINT32	-99999999 to 99999999	Wh per energy format		2
05FB	-	05FC	1532	-	1533	W-hours, Net, Phase B	SINT32	-99999999 to 99999999	Wh per energy format		2

05FD	-	05FE	1534	-	1535	W-hours, Net, Phase C	SINT32	-99999999 to 99999999	Wh per energy format	2
05FF	-	0600	1536	-	1537	W-hours, Total, Phase A	SINT32	0 to 99999999	Wh per energy format	2
0601	-	0602	1538	-	1539	W-hours, Total, Phase B	SINT32	0 to 99999999	Wh per energy format	2
0603	-	0604	1540	-	1541	W-hours, Total, Phase C	SINT32	0 to 99999999	Wh per energy format	2
0605	-	0606	1542	-	1543	VAR-hours, Positive, Phase A	SINT32	0 to 99999999	VARh per energy format	2
0607	-	0608	1544	-	1545	VAR-hours, Positive, Phase B	SINT32	0 to 99999999	VARh per energy format	2
0609	-	060A	1546	-	1547	VAR-hours, Positive, Phase C	SINT32	0 to 99999999	VARh per energy format	2
060B	-	060C	1548	-	1549	VAR-hours, Negative, Phase A	SINT32	0 to -99999999	VARh per energy format	2
060D	-	060E	1550	-	1551	VAR-hours, Negative, Phase B	SINT32	0 to -99999999	VARh per energy format	2
060F	-	0610	1552	-	1553	VAR-hours, Negative, Phase C	SINT32	0 to -99999999	VARh per energy format	2
0611	-	0612	1554	-	1555	VAR-hours, Net, Phase A	SINT32	-99999999 to 99999999	VARh per energy format	2
0613	-	0614	1556	-	1557	VAR-hours, Net, Phase B	SINT32	-99999999 to 99999999	VARh per energy format	2
0615	-	0616	1558	-	1559	VAR-hours, Net, Phase C	SINT32	-99999999 to 99999999	VARh per energy format	2
0617	-	0618	1560	-	1561	VAR-hours, Total, Phase A	SINT32	0 to 99999999	VARh per energy format	2
0619	-	061A	1562	-	1563	VAR-hours, Total, Phase B	SINT32	0 to 99999999	VARh per energy format	2
061B	-	061C	1564	-	1565	VAR-hours, Total, Phase C	SINT32	0 to 99999999	VARh per energy format	2
061D	-	061E	1566	-	1567	VA-hours, Phase A	SINT32	0 to 99999999	VAh per energy format	2
061F	-	0620	1568	-	1569	VA-hours, Phase B	SINT32	0 to 99999999	VAh per energy format	2
0621	-	0622	1570	-	1571	VA-hours, Phase C	SINT32	0 to 99999999	VAh per energy format	2
									Block Size:	72

Primary Demand Block										read-only
07CF	-	07D0	2000	-	2001	Amps A, Average	FLOAT	0 to 9999 M	amps	2
07D1	-	07D2	2002	-	2003	Amps B, Average	FLOAT	0 to 9999 M	amps	2
07D3	-	07D4	2004	-	2005	Amps C, Average	FLOAT	0 to 9999 M	amps	2
07D5	-	07D6	2006	-	2007	Positive Watts, 3-Ph, Average	FLOAT	-9999 M to +9999 M	watts	2
07D7	-	07D8	2008	-	2009	Positive VARs, 3-Ph, Average	FLOAT	-9999 M to +9999 M	VARs	2
07D9	-	07DA	2010	-	2011	Negative Watts, 3-Ph, Average	FLOAT	-9999 M to +9999 M	watts	2
07DB	-	07DC	2012	-	2013	Negative VARs, 3-Ph, Average	FLOAT	-9999 M to +9999 M	VARs	2
07DD	-	07DE	2014	-	2015	VAs, 3-Ph, Average	FLOAT	-9999 M to +9999 M	VAs	2
07DF	-	07E0	2016	-	2017	Positive PF, 3-Ph, Average	FLOAT	-1.00 to +1.00	none	2
07E1	-	07E2	2018	-	2019	Negative PF, 3-PF, Average	FLOAT	-1.00 to +1.00	none	2
07E3	-	07E4	2020	-	2021	Neutral Current, Average	FLOAT	0 to 9999 M	amps	2
07E5	-	07E6	2022	-	2023	Positive Watts, Phase A, Average	FLOAT	-9999 M to +9999 M	watts	2
07E7	-	07E8	2024	-	2025	Positive Watts, Phase B, Average	FLOAT	-9999 M to +9999 M	watts	2
07E9	-	07EA	2026	-	2027	Positive Watts, Phase C, Average	FLOAT	-9999 M to +9999 M	watts	2

07EB - 07EC	2028 - 2029	Positive VARs, Phase A, Average	FLOAT	-9999 M to +9999 M	VARs			2
07ED - 07EE	2030 - 2031	Positive VARs, Phase B, Average	FLOAT	-9999 M to +9999 M	VARs			2
07EF - 07F0	2032 - 2033	Positive VARs, Phase C, Average	FLOAT	-9999 M to +9999 M	VARs			2
07F1 - 07F2	2034 - 2035	Negative Watts, Phase A, Average	FLOAT	-9999 M to +9999 M	watts			2
07F3 - 07F4	2036 - 2037	Negative Watts, Phase B, Average	FLOAT	-9999 M to +9999 M	watts			2
07F5 - 07F6	2038 - 2039	Negative Watts, Phase C, Average	FLOAT	-9999 M to +9999 M	watts			2
07F7 - 07F8	2040 - 2041	Negative VARs, Phase A, Average	FLOAT	-9999 M to +9999 M	VARs			2
07F9 - 07FA	2042 - 2043	Negative VARs, Phase B, Average	FLOAT	-9999 M to +9999 M	VARs			2
07FB - 07FC	2044 - 2045	Negative VARs, Phase C, Average	FLOAT	-9999 M to +9999 M	VARs			2
07FD - 07FE	2046 - 2047	VAs, Phase A, Average	FLOAT	-9999 M to +9999 M	VAs			2
07FF - 0800	2048 - 2049	VAs, Phase B, Average	FLOAT	-9999 M to +9999 M	VAs			2
0801 - 0802	2050 - 2051	VAs, Phase C, Average	FLOAT	-9999 M to +9999 M	VAs			2
0803 - 0804	2052 - 2053	Positive PF, Phase A, Average	FLOAT	-1.00 to +1.00	none			2
0805 - 0806	2054 - 2055	Positive PF, Phase B, Average	FLOAT	-1.00 to +1.00	none			2
0807 - 0808	2056 - 2057	Positive PF, Phase C, Average	FLOAT	-1.00 to +1.00	none			2
0809 - 080A	2058 - 2059	Negative PF, Phase A, Average	FLOAT	-1.00 to +1.00	none			2
080B - 080C	2060 - 2061	Negative PF, Phase B, Average	FLOAT	-1.00 to +1.00	none			2
080D - 080E	2062 - 2063	Negative PF, Phase C, Average	FLOAT	-1.00 to +1.00	none			2
							Block Size:	64
Phase Angle Block							read-only	
1003 - 1003	4100 - 4100	Phase A Current	SINT16	-1800 to +1800	0.1 degree			1
1004 - 1004	4101 - 4101	Phase B Current	SINT16	-1800 to +1800	0.1 degree			1
1005 - 1005	4102 - 4102	Phase C Current	SINT16	-1800 to +1800	0.1 degree			1
1006 - 1006	4103 - 4103	Angle, Volts A-B	SINT16	-1800 to +1800	0.1 degree			1
1007 - 1007	4104 - 4104	Angle, Volts B-C	SINT16	-1800 to +1800	0.1 degree			1
1008 - 1008	4105 - 4105	Angle, Volts C-A	SINT16	-1800 to +1800	0.1 degree			1
							Block Size:	6

Status Block							read-only	
1193 - 1193	4500 - 4500	Port ID	UINT16	1 to 4	none		Identifies which COM port a master is connected to: 2 for COM2, etc. See chapter 5 for COM port assignments.	1

1194 - 1194	4501 - 4501	Meter Status	UINT16	bit-mapped	mmmpch-- -ffeeccc	mmm = measurement state (0=off, 1=running normally, 2=limp mode, 3=warmup, 6&7=boot, others unused) See note 16. pch = NVMEM block OK flags (p=profile, c=calibration, h=header), flag is 1 if OK ff = flash state (0=initializing, 1=logging disabled by Vswitch, 3=logging) ee = edit state (0=startup, 1=normal, 2=privileged command session, 3=profile update mode) ccc = port enabled for edit(0=none, 1-4=COM1-COM4, 7=front panel)	1
1195 - 1195	4502 - 4502	Limits Status	UINT16	bit-mapped	87654321 87654321	High byte is setpt 1, 0=in, 1=out low byte is setpt 2, 0=in, 1=out see notes 11, 12, 17	1
1196 - 1197	4503 - 4504	Time Since Reset	UINT32	0 to 4294967294	4 msec	Wraps around after max count.	2
1198 - 119A	4505 - 4507	Meter On Time	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
119B - 119D	4508 - 4510	Current Date and Time	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
119E - 119E	4511 - 4511	Reserved				Reserved	1
119F - 119F	4512 - 4512	Current Day of Week	UINT16	1 to 7	1 day	1=Sun, 2=Mon, etc.	1
						Block Size:	13
THD Block[13]						read-only	
176F - 176F	6000 - 6000	Volts A-N, %THD	UINT16	0 to 10000	0.01%		1
1770 - 1770	6001 - 6001	Volts B-N, %THD	UINT16	0 to 10000	0.01%		1
1771 - 1771	6002 - 6002	Volts C-N, %THD	UINT16	0 to 10000	0.01%		1
1772 - 1772	6003 - 6003	Amps A, %THD	UINT16	0 to 10000	0.01%		1
1773 - 1773	6004 - 6004	Amps B, %THD	UINT16	0 to 10000	0.01%		1
1774 - 1774	6005 - 6005	Amps C, %THD	UINT16	0 to 10000	0.01%		1

1775 - 179C	6006 - 6045	Phase A Voltage harmonic magnitudes	UINT16	0 to 10000	0.01%	In each group of 40 registers, the first register represents the fundamental frequency or first harmonic, the second represents the second harmonic, and so on up to the 40th register which represents the 40th harmonic. Harmonic magnitudes are given as % of the fundamental magnitude. Thus the first register in each group of 40 will typically be 9999. A reading of 10000 indicates invalid.	40
179D - 17C4	6046 - 6085	Phase A Voltage harmonic phases	SINT16	-1800 to +1800	0.1 degree		40
17C5 - 17EC	6086 - 6125	Phase A Current harmonic magnitudes	UINT16	0 to 10000	0.01%		40
17ED - 1814	6126 - 6165	Phase A Current harmonic phases	SINT16	-1800 to +1800	0.1 degree		40
1815 - 183C	6166 - 6205	Phase B Voltage harmonic magnitudes	UINT16	0 to 10000	0.01%		40
183D - 1864	6206 - 6245	Phase B Voltage harmonic phases	SINT16	-1800 to +1800	0.1 degree		40
1865 - 188C	6246 - 6285	Phase B Current harmonic magnitudes	UINT16	0 to 10000	0.01%		40
188D - 18B4	6286 - 6325	Phase B Current harmonic phases	SINT16	-1800 to +1800	0.1 degree		40
18B5 - 18DC	6326 - 6365	Phase C Voltage harmonic magnitudes	UINT16	0 to 10000	0.01%		40
18DD - 1904	6366 - 6405	Phase C Voltage harmonic phases	SINT16	-1800 to +1800	0.1 degree		40
1905 - 192C	6406 - 6445	Phase C Current harmonic magnitudes	UINT16	0 to 10000	0.01%		40
192D - 1954	6446 - 6485	Phase C Current harmonic phases	SINT16	-1800 to +1800	0.1 degree		40
1955 - 1955	6486 - 6486	Wave Scope scale factor for channel Va	UINT16	0 to 32767		Convert individual samples to volts or amps: V or A = (sample * scale factor) / 1,000,000 Samples update in conjunction with THD and harmonics; samples not available (all zeroes) if THD not available.	1
1956 - 1956	6487 - 6487	Wave Scope scale factors for channel Ib	UINT16	0 to 32767			1
1957 - 1958	6488 - 6489	Wave Scope scale factors for channels Vb and Ib	UINT16	0 to 32767			2
1959 - 195A	6490 - 6491	Wave Scope scale factors for channels Vc and Ic	UINT16	0 to 32767			2
195B - 199A	6492 - 6555	Wave Scope samples for channel Va	SINT16	-32768 to +32767			64
199B - 19DA	6556 - 6619	Wave Scope samples for channel Vb	SINT16	-32768 to +32767			64
19DB - 1A1A	6620 - 6683	Wave Scope samples for channel Vc	SINT16	-32768 to +32767			64
1A1B - 1A5A	6684 - 6747	Wave Scope samples for channel Ia	SINT16	-32768 to +32767			64
1A5B - 1A9A	6748 - 6811	Wave Scope samples for channel Ib	SINT16	-32768 to +32767			64
1A9B - 1ADA	6812 - 6875	Wave Scope samples for channel Ic	SINT16	-32768 to +32767			64
						Block Size:	876

Primary Minimum Block									read-only	
1F3F - 1F40	8000 - 8001	Volts A-N, Minimum	FLOAT	0 to 9999 M	volts		2
1F41 - 1F42	8002 - 8003	Volts B-N, Minimum	FLOAT	0 to 9999 M	volts		2
1F43 - 1F44	8004 - 8005	Volts C-N, Minimum	FLOAT	0 to 9999 M	volts		2
1F45 - 1F46	8006 - 8007	Volts A-B, Minimum	FLOAT	0 to 9999 M	volts		2
1F47 - 1F48	8008 - 8009	Volts B-C, Minimum	FLOAT	0 to 9999 M	volts		2
1F49 - 1F4A	8010 - 8011	Volts C-A, Minimum	FLOAT	0 to 9999 M	volts		2
1F4B - 1F4C	8012 - 8013	Amps A, Minimum Avg Demand	FLOAT	0 to 9999 M	amps		2
1F4D - 1F4E	8014 - 8015	Amps B, Minimum Avg Demand	FLOAT	0 to 9999 M	amps		2
1F4F - 1F50	8016 - 8017	Amps C, Minimum Avg Demand	FLOAT	0 to 9999 M	amps		2

1F51	-	1F52	8018	-	8019	Positive Watts, 3-Ph, Minimum Avg Demand	FLOAT	0 to +9999 M	watts	2
1F53	-	1F54	8020	-	8021	Positive VARs, 3-Ph, Minimum Avg Demand	FLOAT	0 to +9999 M	VARs	2
1F55	-	1F56	8022	-	8023	Negative Watts, 3-Ph, Minimum Avg Demand	FLOAT	0 to +9999 M	watts	2
1F57	-	1F58	8024	-	8025	Negative VARs, 3-Ph, Minimum Avg Demand	FLOAT	0 to +9999 M	VARs	2
1F59	-	1F5A	8026	-	8027	VAs, 3-Ph, Minimum Avg Demand	FLOAT	-9999 M to +9999 M	VAs	2
1F5B	-	1F5C	8028	-	8029	Positive Power Factor, 3-Ph, Minimum Avg Demand	FLOAT	-1.00 to +1.00	none	2
1F5D	-	1F5E	8030	-	8031	Negative Power Factor, 3-Ph, Minimum Avg Demand	FLOAT	-1.00 to +1.00	none	2
1F5F	-	1F60	8032	-	8033	Frequency, Minimum	FLOAT	0 to 65.00	Hz	2
1F61	-	1F62	8034	-	8035	Neutral Current, Minimum Avg Demand	FLOAT	0 to 9999 M	amps	2
1F63	-	1F64	8036	-	8037	Positive Watts, Phase A, Minimum Avg Demand	FLOAT	-9999 M to +9999 M	watts	2
1F65	-	1F66	8038	-	8039	Positive Watts, Phase B, Minimum Avg Demand	FLOAT	-9999 M to +9999 M	watts	2
1F67	-	1F68	8040	-	8041	Positive Watts, Phase C, Minimum Avg Demand	FLOAT	-9999 M to +9999 M	watts	2
1F69	-	1F6A	8042	-	8043	Positive VARs, Phase A, Minimum Avg Demand	FLOAT	-9999 M to +9999 M	VARs	2
1F6B	-	1F6C	8044	-	8045	Positive VARs, Phase B, Minimum Avg Demand	FLOAT	-9999 M to +9999 M	VARs	2
1F6D	-	1F6E	8046	-	8047	Positive VARs, Phase C, Minimum Avg Demand	FLOAT	-9999 M to +9999 M	VARs	2
1F6F	-	1F70	8048	-	8049	Negative Watts, Phase A, Minimum Avg Demand	FLOAT	-9999 M to +9999 M	watts	2
1F71	-	1F72	8050	-	8051	Negative Watts, Phase B, Minimum Avg Demand	FLOAT	-9999 M to +9999 M	watts	2
1F73	-	1F74	8052	-	8053	Negative Watts, Phase C, Minimum Avg Demand	FLOAT	-9999 M to +9999 M	watts	2
1F75	-	1F76	8054	-	8055	Negative VARs, Phase A, Minimum Avg Demand	FLOAT	-9999 M to +9999 M	VARs	2
1F77	-	1F78	8056	-	8057	Negative VARs, Phase B, Minimum Avg Demand	FLOAT	-9999 M to +9999 M	VARs	2
1F79	-	1F7A	8058	-	8059	Negative VARs, Phase C, Minimum Avg Demand	FLOAT	-9999 M to +9999 M	VARs	2
1F7B	-	1F7C	8060	-	8061	VAs, Phase A, Minimum Avg Demand	FLOAT	-9999 M to +9999 M	VAs	2
1F7D	-	1F7E	8062	-	8063	VAs, Phase B, Minimum Avg Demand	FLOAT	-9999 M to +9999 M	VAs	2
1F7F	-	1F80	8064	-	8065	VAs, Phase C, Minimum Avg Demand	FLOAT	-9999 M to +9999 M	VAs	2
1F81	-	1F82	8066	-	8067	Positive PF, Phase A, Minimum Avg Demand	FLOAT	-1.00 to +1.00	none	2
1F83	-	1F84	8068	-	8069	Positive PF, Phase B, Minimum Avg Demand	FLOAT	-1.00 to +1.00	none	2
1F85	-	1F86	8070	-	8071	Positive PF, Phase C, Minimum Avg Demand	FLOAT	-1.00 to +1.00	none	2
1F87	-	1F88	8072	-	8073	Negative PF, Phase A, Minimum Avg Demand	FLOAT	-1.00 to +1.00	none	2
1F89	-	1F8A	8074	-	8075	Negative PF, Phase B, Minimum Avg Demand	FLOAT	-1.00 to +1.00	none	2
1F8B	-	1F8C	8076	-	8077	Negative PF, Phase C, Minimum Avg Demand	FLOAT	-1.00 to +1.00	none	2

1F8D	-	1F8D	8078	-	8078	Volts A-N, %THD, Minimum	UINT16	0 to 9999	0.01%		1
1F8E	-	1F8E	8079	-	8079	Volts B-N, %THD, Minimum	UINT16	0 to 9999	0.01%		1
1F8F	-	1F8F	8080	-	8080	Volts C-N, %THD, Minimum	UINT16	0 to 9999	0.01%		1
1F90	-	1F90	8081	-	8081	Amps A, %THD, Minimum	UINT16	0 to 9999	0.01%		1
1F91	-	1F91	8082	-	8082	Amps B, %THD, Minimum	UINT16	0 to 9999	0.01%		1
1F92	-	1F92	8083	-	8083	Amps C, %THD, Minimum	UINT16	0 to 9999	0.01%		1
1F93	-	1F9B	8084	-	8092	Reserved				Reserved	9
										Block Size:	93

Primary Minimum Timestamp Block										read-only	
20CF	-	20D1	8400	-	8402	Volts A-N, Min Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
20D2	-	20D4	8403	-	8405	Volts B-N, Min Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
20D5	-	20D7	8406	-	8408	Volts C-N, Min Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
20D8	-	20DA	8409	-	8411	Volts A-B, Min Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
20DB	-	20DD	8412	-	8414	Volts B-C, Min Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
20DE	-	20E0	8415	-	8417	Volts C-A, Min Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
20E1	-	20E3	8418	-	8420	Amps A, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
20E4	-	20E6	8421	-	8423	Amps B, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
20E7	-	20E9	8424	-	8426	Amps C, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
20EA	-	20EC	8427	-	8429	Positive Watts, 3-Ph, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
20ED	-	20EF	8430	-	8432	Positive VARs, 3-Ph, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
20F0	-	20F2	8433	-	8435	Negative Watts, 3-Ph, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
20F3	-	20F5	8436	-	8438	Negative VARs, 3-Ph, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
20F6	-	20F8	8439	-	8441	VAs, 3-Ph, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
20F9	-	20FB	8442	-	8444	Positive Power Factor, 3-Ph, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
20FC	-	20FE	8445	-	8447	Negative Power Factor, 3-Ph, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
20FF	-	2101	8448	-	8450	Frequency, Min Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2102	-	2104	8451	-	8453	Neutral Current, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2100	2 sec		3
2105	-	2107	8454	-	8456	Positive Watts, Phase A, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2108	-	210A	8457	-	8459	Positive Watts, Phase B, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3

210B - 210D	8460 - 8462	Positive Watts, Phase C, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
210E - 2110	8463 - 8465	Positive VARs, Phase A, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2111 - 2113	8466 - 8468	Positive VARs, Phase B, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2114 - 2116	8469 - 8471	Positive VARs, Phase C, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2117 - 2119	8472 - 8474	Negative Watts, Phase A, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
211A - 211C	8475 - 8477	Negative Watts, Phase B, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
211D - 211F	8478 - 8480	Negative Watts, Phase C, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2120 - 2122	8481 - 8483	Negative VARs, Phase A, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2123 - 2125	8484 - 8486	Negative VARs, Phase B, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2126 - 2128	8487 - 8489	Negative VARs, Phase C, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2129 - 212B	8490 - 8492	VAs, Phase A, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
212C - 212E	8493 - 8495	VAs, Phase B, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
212F - 2131	8496 - 8498	VAs, Phase C, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2132 - 2134	8499 - 8501	Positive PF, Phase A, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2135 - 2137	8502 - 8504	Positive PF, Phase B, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2138 - 213A	8505 - 8507	Positive PF, Phase C, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
213B - 213D	8508 - 8510	Negative PF, Phase A, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
213E - 2140	8511 - 8513	Negative PF, Phase B, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2141 - 2143	8514 - 8516	Negative PF, Phase C, Min Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2144 - 2146	8517 - 8519	Volts A-N, %THD, Min Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2147 - 2149	8520 - 8522	Volts B-N, %THD, Min Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
214A - 214C	8523 - 8525	Volts C-N, %THD, Min Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
214D - 214F	8526 - 8528	Amps A, %THD, Min Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3

2150 - 2152	8529 - 8531	Amps B, %THD, Min Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2153 - 2155	8532 - 8534	Amps C, %THD, Min Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2156 - 2167	8535 - 8552	Reserved				Reserved	18
						Block Size:	153
Primary Maximum Block						read-only	
2327 - 2328	9000 - 9001	Volts A-N, Maximum	FLOAT	0 to 9999 M	volts		2
2329 - 232A	9002 - 9003	Volts B-N, Maximum	FLOAT	0 to 9999 M	volts		2
232B - 232C	9004 - 9005	Volts C-N, Maximum	FLOAT	0 to 9999 M	volts		2
232D - 232E	9006 - 9007	Volts A-B, Maximum	FLOAT	0 to 9999 M	volts		2
232F - 2330	9008 - 9009	Volts B-C, Maximum	FLOAT	0 to 9999 M	volts		2
2331 - 2332	9010 - 9011	Volts C-A, Maximum	FLOAT	0 to 9999 M	volts		2
2333 - 2334	9012 - 9013	Amps A, Maximum Avg Demand	FLOAT	0 to 9999 M	amps		2
2335 - 2336	9014 - 9015	Amps B, Maximum Avg Demand	FLOAT	0 to 9999 M	amps		2
2337 - 2338	9016 - 9017	Amps C, Maximum Avg Demand	FLOAT	0 to 9999 M	amps		2
2339 - 233A	9018 - 9019	Positive Watts, 3-Ph, Maximum Avg Demand	FLOAT	0 to +9999 M	watts		2
233B - 233C	9020 - 9021	Positive VARs, 3-Ph, Maximum Avg Demand	FLOAT	0 to +9999 M	VARs		2
233D - 233E	9022 - 9023	Negative Watts, 3-Ph, Maximum Avg Demand	FLOAT	0 to +9999 M	watts		2
233F - 2340	9024 - 9025	Negative VARs, 3-Ph, Maximum Avg Demand	FLOAT	0 to +9999 M	VARs		2
2341 - 2342	9026 - 9027	VAs, 3-Ph, Maximum Avg Demand	FLOAT	-9999 M to +9999 M	VAs		2
2343 - 2344	9028 - 9029	Positive Power Factor, 3-Ph, Maximum Avg Demand	FLOAT	-1.00 to +1.00	none		2
2345 - 2346	9030 - 9031	Negative Power Factor, 3-Ph, Maximum Avg Demand	FLOAT	-1.00 to +1.00	none		2
2347 - 2348	9032 - 9033	Frequency, Maximum	FLOAT	0 to 65.00	Hz		2
2349 - 234A	9034 - 9035	Neutral Current, Maximum Avg Demand	FLOAT	0 to 9999 M	amps		2
234B - 234C	9036 - 9037	Positive Watts, Phase A, Maximum Avg Demand	FLOAT	-9999 M to +9999 M	watts		2
234D - 234E	9038 - 9039	Positive Watts, Phase B, Maximum Avg Demand	FLOAT	-9999 M to +9999 M	watts		2
234F - 2350	9040 - 9041	Positive Watts, Phase C, Maximum Avg Demand	FLOAT	-9999 M to +9999 M	watts		2
2351 - 2352	9042 - 9043	Positive VARs, Phase A, Maximum Avg Demand	FLOAT	-9999 M to +9999 M	VARs		2
2353 - 2354	9044 - 9045	Positive VARs, Phase B, Maximum Avg Demand	FLOAT	-9999 M to +9999 M	VARs		2

2355 - 2356	9046 - 9047	Positive VARs, Phase C, Maximum Avg Demand	FLOAT	-9999 M to +9999 M	VARs		2
2357 - 2358	9048 - 9049	Negative Watts, Phase A, Maximum Avg Demand	FLOAT	-9999 M to +9999 M	watts		2
2359 - 235A	9050 - 9051	Negative Watts, Phase B, Maximum Avg Demand	FLOAT	-9999 M to +9999 M	watts		2
235B - 235C	9052 - 9053	Negative Watts, Phase C, Maximum Avg Demand	FLOAT	-9999 M to +9999 M	watts		2
235D - 235E	9054 - 9055	Negative VARs, Phase A, Maximum Avg Demand	FLOAT	-9999 M to +9999 M	VARs		2
235F - 2360	9056 - 9057	Negative VARs, Phase B, Maximum Avg Demand	FLOAT	-9999 M to +9999 M	VARs		2
2361 - 2362	9058 - 9059	Negative VARs, Phase C, Maximum Avg Demand	FLOAT	-9999 M to +9999 M	VARs		2
2363 - 2364	9060 - 9061	VAs, Phase A, Maximum Avg Demand	FLOAT	-9999 M to +9999 M	VAs		2
2365 - 2366	9062 - 9063	VAs, Phase B, Maximum Avg Demand	FLOAT	-9999 M to +9999 M	VAs		2
2367 - 2368	9064 - 9065	VAs, Phase C, Maximum Avg Demand	FLOAT	-9999 M to +9999 M	VAs		2
2369 - 236A	9066 - 9067	Positive PF, Phase A, Maximum Avg Demand	FLOAT	-1.00 to +1.00	none		2
236B - 236C	9068 - 9069	Positive PF, Phase B, Maximum Avg Demand	FLOAT	-1.00 to +1.00	none		2
236D - 236E	9070 - 9071	Positive PF, Phase C, Maximum Avg Demand	FLOAT	-1.00 to +1.00	none		2
236F - 2370	9072 - 9073	Negative PF, Phase A, Maximum Avg Demand	FLOAT	-1.00 to +1.00	none		2
2371 - 2372	9074 - 9075	Negative PF, Phase B, Maximum Avg Demand	FLOAT	-1.00 to +1.00	none		2
2373 - 2374	9076 - 9077	Negative PF, Phase C, Maximum Avg Demand	FLOAT	-1.00 to +1.00	none		2
2375 - 2375	9078 - 9078	Volts A-N, %THD, Maximum	UINT16	0 to 9999	0.01%		1
2376 - 2376	9079 - 9079	Volts B-N, %THD, Maximum	UINT16	0 to 9999	0.01%		1
2377 - 2377	9080 - 9080	Volts C-N, %THD, Maximum	UINT16	0 to 9999	0.01%		1
2378 - 2378	9081 - 9081	Amps A, %THD, Maximum	UINT16	0 to 9999	0.01%		1
2379 - 2379	9082 - 9082	Amps B, %THD, Maximum	UINT16	0 to 9999	0.01%		1
237A - 237A	9083 - 9083	Amps C, %THD, Maximum	UINT16	0 to 9999	0.01%		1
237B - 2383	9084 - 9092	Reserved				Reserved	9
						Block Size:	93

Primary Maximum Timestamp Block						read-only	

24B7 - 24B9	9400 - 9402	Volts A-N, Max Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec			3
24BA - 24BC	9403 - 9405	Volts B-N, Max Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec			3
24BD - 24BF	9406 - 9408	Volts C-N, Max Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec			3
24C0 - 24C2	9409 - 9411	Volts A-B, Max Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec			3
24C3 - 24C5	9412 - 9414	Volts B-C, Max Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec			3
24C6 - 24C8	9415 - 9417	Volts C-A, Max Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec			3
24C9 - 24CB	9418 - 9420	Amps A, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec			3
24CC - 24CE	9421 - 9423	Amps B, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec			3
24CF - 24D1	9424 - 9426	Amps C, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec			3
24D2 - 24D4	9427 - 9429	Positive Watts, 3-Ph, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec			3
24D5 - 24D7	9430 - 9432	Positive VARs, 3-Ph, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec			3
24D8 - 24DA	9433 - 9435	Negative Watts, 3-Ph, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec			3
24DB - 24DD	9436 - 9438	Negative VARs, 3-Ph, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec			3
24DE - 24E0	9439 - 9441	VAs, 3-Ph, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec			3
24E1 - 24E3	9442 - 9444	Positive Power Factor, 3-Ph, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec			3
24E4 - 24E6	9445 - 9447	Negative Power Factor, 3-Ph, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec			3
24E7 - 24E9	9448 - 9450	Frequency, Max Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec			3
24EA - 24EC	9451 - 9453	Neutral Current, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2100	1 sec			3
24ED - 24EF	9454 - 9456	Positive Watts, Phase A, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec			3
24F0 - 24F2	9457 - 9459	Positive Watts, Phase B, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec			3
24F3 - 24F5	9460 - 9462	Positive Watts, Phase C, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec			3
24F6 - 24F8	9463 - 9465	Positive VARs, Phase A, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec			3
24F9 - 24FB	9466 - 9468	Positive VARs, Phase B, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec			3
24FC - 24FE	9469 - 9471	Positive VARs, Phase C, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec			3

24FF - 2501	9472 - 9474	Negative Watts, Phase A, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2502 - 2504	9475 - 9477	Negative Watts, Phase B, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2505 - 2507	9478 - 9480	Negative Watts, Phase C, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2508 - 250A	9481 - 9483	Negative VARs, Phase A, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
250B - 250D	9484 - 9486	Negative VARs, Phase B, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
250E - 2510	9487 - 9489	Negative VARs, Phase C, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2511 - 2513	9490 - 9492	VAs, Phase A, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2514 - 2516	9493 - 9495	VAs, Phase B, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2517 - 2519	9496 - 9498	VAs, Phase C, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
251A - 251C	9499 - 9501	Positive PF, Phase A, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
251D - 251F	9502 - 9504	Positive PF, Phase B, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2520 - 2522	9505 - 9507	Positive PF, Phase C, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2523 - 2525	9508 - 9510	Negative PF, Phase A, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2526 - 2528	9511 - 9513	Negative PF, Phase B, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2529 - 252B	9514 - 9516	Negative PF, Phase C, Max Avg Dmd Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
252C - 252E	9517 - 9519	Volts A-N, %THD, Max Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
252F - 2531	9520 - 9522	Volts B-N, %THD, Max Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2532 - 2534	9523 - 9525	Volts C-N, %THD, Max Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2535 - 2537	9526 - 9528	Amps A, %THD, Max Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
2538 - 253A	9529 - 9531	Amps B, %THD, Max Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
253B - 253D	9532 - 9534	Amps C, %THD, Max Timestamp	TSTAMP	1Jan2000 - 31Dec2099	1 sec		3
253E - 254F	9535 - 9552	Reserved				Reserved	18
						Block Size:	153
Option Card 1 Section							

Card Identification and Configuration Block (Note 14)						read-only	
270F - 270F	10000 - 10000	Class ID and card status	UINT16	bit-mapped	undv-----ccccttttt	Flags active if bit is set: u=unsupported card; n=card need configuration; d=card is using default configuration; v=communication with card is ok Field: cccc=class of installed card. Field tttt=type of card. See note 19.	1
2710 - 2710	10001 - 10001	Reserved				Reserved	1
2711 - 2718	10002 - 10009	Card name	ASCII	16 char	none	ASCII name of the installed card.	8
2719 - 2720	10010 - 10017	Serial number	ASCII	16 char	none	Serial Number in ASCII of the installed card.	8
2721 - 2722	10018 - 10019	Version	ASCII	4 char	none	Version in ASCII of the hardware of the installed card.	2
2723 - 2746	10020 - 10055	Reserved				Reserved	36
2747 - 2748	10056 - 10057	Firmware Version	ASCII	4 char	none	Version of the BOOT firmware of the card, left justified and padded with spaces. Blank for boards without embedded firmware.	2
2749 - 274A	10058 - 10059	Firmware Version	ASCII	4 char	none	Version of the RUN firmware of the card, left justified and padded with spaces. Blank for boards without embedded firmware.	2
274B - 274E	10060 - 10063	Reserved				Reserved	4
						Block Size:	64
Current Communication Settings for Option Card 1						Read-only	
274F - 274F	10064 - 10064	Current speed and format	UINT16	bit-mapped	-abcde-- fghijklm	Bps: a=57600; b=38400; c=19200; d=14400; e=9600 Stop bits 'f': cleared 1 stop bit, set 2 stop bits Parity: g=even; h=odd; i=none Data bits: j=8; k=7; l=6; m=5	1

2750 - 2750	10065 - 10065	Reserved	UINT16	bit-mapped		Reserved	1
2751 - 2751	10066 - 10066	Current protocol	UINT16	bit-mapped	-------- -----ppp-	ppp= 100 =DNP3 Lite; 010=ASCII Modbus; 001=RTU Modbus	1
2752 - 2752	10067 - 10067	Current reply delay	UINT16	0 to 65535	milliseconds	Delay to reply a Modbus transaction after receiving it.	1
2753 - 2756	10068 - 10071	Reserved				Reserved	4
						Block Size:	8
Data and Control Blocks						read-only	
2757 - 2790	10072 - 10129	Data and Control Block for Option Card 1. Meaning of registers depend on installed card. -- see below				Register assignments depend on which type of card is in the slot. See overlays below.	58
						Block Size:	66
		Expansions for Data and Control Block for Option Card 1					
Data and Control Block -- **Digital I/O Relay Card Overlay (Note 15)**						read-only except as indicated	
2757 - 2757	10072 - 10072	Digital Input States	UINT16	bit-mapped	-------- 22221111	Two nibble fields: (2222) for input#2 and (1111) for input #1. Lsb in each nibble is the current state of the input. Msb in each nibble is the oldest registered state.	1
2758 - 2758	10073 - 10073	Digital Relay States	UINT16	bit-mapped	-------- --ab--cd	If "a" is 1 then state of Relay#2 is unknown, otherwise state of Relay#2 is informed in "c": (1=tripped, 0=released). If "b" is 1 then state of Relay#1 is unknown, otherwise state of Relay#1 is informed in "d": (1=tripped, 0=released).	1
2759 - 2759	10074 - 10074	Turn relay on	UINT16	bit-mapped	-------- ------21	Writing a 1 in bit N turns relay N+1 ON (this register is write-able only in privileged session).	1

275A - 275A	10075 - 10075	Turn relay off	UINT16	bit-mapped	-------- ------21	Writing a 1 in bit N turns relay N+1 OFF (this register is write-able only in privileged session).	1
275B - 275B	10076 - 10076	Trip/Release delay timer for Relay 1	UINT16	0 to 9999	0.1 sec	Time to trip or release.	1
275C - 275C	10077 - 10077	Trip/Release delay timer for Relay 2	UINT16	0 to 9999	0.1 sec	Time to trip or release.	1
275D - 275E	10078 - 10079	Reserved				Reserved	2
275F - 275F	10080 - 10080	Input 1 Accumulator, Scaled	UINT16	0 to 9999	resolution is 1, 10, 100, 1000, 10000, or 100000 counts	Disabled accumulators always read 0.	1
2760 - 2760	10081 - 10081	Input 2 Accumulator, Scaled	UINT16	0 to 9999			1
2761 - 2762	10082 - 10083	Reserved				Reserved	2
2763 - 2763	10084 - 10084	Relay 1 Accumulator, Scaled	UINT16	0 to 9999	resolution is 1, 10, 100, 1000, 10000, or 100000 counts	Disabled accumulators always read 0.	1
2764 - 2764	10085 - 10085	Relay 2 Accumulator, Scaled	UINT16	0 to 9999			1
2765 - 2790	10086 - 10129	Reserved				Reserved	44
						Block Size:	58

Data and Control Block -- **Digital I/O Pulse Output Card Overlay (Note 15)**						read-only except as indicated	
2757 - 2757	10072 - 10072	Digital Input States	UINT16	bit-mapped	dddd cccc bbbb aaaa	Nibble "dddd" for input#4, "cccc" for input#3, "bbbb" for input#2 and "aaaa" for input#1. Within each field, rightmost bit is the current state (1=closed, 0=open), and bits at left are the older states 100ms apart. (historical states). Example: xxxx xxxx xxxx 0011 Current state of input#1 is closed, before that it was closed too, before that it was open and the oldest state known is open.	1

2758 - 2758	10073 - 10073	Digital Output States	UINT16	bit-mapped	-------- ----4321	One bit for each output. Bit 4 is for output #4, and bit 1 is for output #1. If a bit is set the output is closed, otherwise it is opened.	1
2759 - 2759	10074 - 10074	Pulse Output Test Select	UINT16	bit-mapped	-------- ----4321	Writing 1 in bit N sets Pulse Output N+1 in test mode. Writing 0 otherwise, reestablished the output in normal operation (only while in privileged session). When Reading this reports which Pulse Output is under test according to the bits set or cleared (1=under test, 0=normal).	1
275A - 275A	10075 - 10075	Pulse Output Test Power	UINT16	bit-mapped	ddvvvvvv vvvvvvvv	This register is Writeable in privileged session only. Simulates constant Power for the Pulse Output under test. Format is same as Kt settings for Pulse Output. "V" is raw value in Wh/pulse from 0 to 9999. "dd"=decimal point position: 00=0.XXXX, 01=X.XXX, 10=XX.XX, 11= X.XXX.	1
275B - 275E	10076 - 10079	Reserved				Reserved	4
275F - 275F	10080 - 10080	Input 1 Accumulator, Scaled	UINT16	0 to 9999	resolution is 1, 10, 100, 1000, 10000, or 100000 counts	Disabled accumulators always read 0.	1
2760 - 2760	10081 - 10081	Input 2 Accumulator, Scaled	UINT16	0 to 9999			1
2761 - 2761	10082 - 10082	Input 3 Accumulator, Scaled	UINT16	0 to 9999			1
2762 - 2762	10083 - 10083	Input 4 Accumulator, Scaled	UINT16	0 to 9999			1
2763 - 2763	10084 - 10084	Output 1 Accumulator, Scaled	UINT16	0 to 9999			1
2764 - 2764	10085 - 10085	Output 2 Accumulator, Scaled	UINT16	0 to 9999			1
2765 - 2765	10086 - 10086	Output 3 Accumulator, Scaled	UINT16	0 to 9999			1
2766 - 2766	10087 - 10087	Output 4 Accumulator, Scaled	UINT16	0 to 9999			1
2767 - 2790	10088 - 10129	Reserved				Reserved	42
						Block Size:	58
Data and Control Block: **Analog Out 0-1mA / Analog Out 4-20mA (Note 15)**						read-only	

2757 - 2757	10072 - 10072	Status of card	UINT16	bit-mapped	----cf-- --------	Flag fields: c=calibration not good; f=configuration error	1
2758 - 2790	10073 - 10129	Reserved	UINT16			Reserved	57
						Block Size:	58
Data and Control Block -- **Reserved Block**						read-only	
2757 - 2790	10072 - 10129	Reserved				Reserved	58
						Block Size:	58

2B37 - 2B37	11064 - 11064	Current speed and format	UINT16	bit-mapped	-abcde-- fghıjklm	Bps: a=57600; b=38400; c=19200; d=14400; e=9600 Stop bits 'f': cleared 1 stop bit, set 2 stop bits Parity: g=even; h=odd; i=none Data bits: j=8; k=7; l=6; m=5		1
2B38 - 2B38	11065 - 11065	Reserved	UINT16	bit-mapped		Reserved		1
2B39 - 2B39	11066 - 11066	Current protocol	UINT16	bit-mapped	-------- -----ppp-	ppp= 100 =DNP3 Lite; 010=ASCII Modbus; 001=RTU Modbus		1
2B3A - 2B3A	11067 - 11067	Current reply delay	UINT16	0 to 65535	milliseconds	Delay to reply a Modbus transaction after receiving it.		1
2B3B - 2B3E	11068 - 11071	Reserved				Reserved		4
							Block Size:	8
Data and Control Blocks							read-only	
2B3F - 2B78	11072 - 11129	Data and Control Block for Option Card 2 Meaning of registers depend on installed card. -- see below				Register assignments depend on which type of card is in the slot. See overlays below.		58
							Block Size:	66
		Expansions for Data and Control Block for Option Card 2						
Data and Control Block -- **Digital I/O Relay Card Overlay (Note 15)**							read-only except as indicated	
2B3F - 2B3F	11072 - 11072	Digital Input States	UINT16	bit-mapped	-------- 22221111	Two nibble fields: (2222) for input#2 and (1111) for input #1. Lsb in each nibble is the current state of the input. Msb in each nibble is the oldest registered state.		1
2B40 - 2B40	11073 - 11073	Digital Relay States	UINT16	bit-mapped	-------- --ab--cd	If "a" is 1 then state of Relay#2 is unknown, otherwise state of Relay#2 is informed in "c": (1=tripped, 0=released). If "b" is 1 then state of Relay#1 is unknown, otherwise state of Relay#1 is informed in "d": (1=tripped, 0=released).		1

2B41 - 2B41	11074 - 11074	Turn relay on	UINT16	bit-mapped	-------- ------21	Writing a 1 in bit N turns relay N+1 ON (this register is write-able only in privileged session).	1
2B42 - 2B42	11075 - 11075	Turn relay off	UINT16	bit-mapped	-------- ------21	Writing a 1 in bit N turns relay N+1 OFF (this register is write-able only in privileged session).	1
2B43 - 2B43	11076 - 11076	Trip/Release delay timer for Relay 1	UINT16	0 to 9999	0.1 sec	Time to trip or release.	1
2B44 - 2B44	11077 - 11077	Trip/Release delay timer for Relay 2	UINT16	0 to 9999	0.1 sec	Time to trip or release.	1
2B45 - 2B46	11078 - 11079	Reserved				Reserved	2
2B47 - 2B47	11080 - 11080	Input 1 Accumulator, Scaled	UINT16	0 to 9999	resolution is 1, 10, 100, 1000, 10000, or 100000 counts	Disabled accumulators always read 0.	1
2B48 - 2B48	11081 - 11081	Input 2 Accumulator, Scaled	UINT16	0 to 9999			1
2B49 - 2B4A	11082 - 11083	Reserved				Reserved	2
2B4B - 2B4B	11084 - 11084	Relay 1 Accumulator, Scaled	UINT16	0 to 9999	resolution is 1, 10, 100, 1000, 10000, or 100000 counts	Disabled accumulators always read 0.	1
2B4C - 2B4C	11085 - 11085	Relay 2 Accumulator, Scaled	UINT16	0 to 9999			1
2B4D - 2B78	11086 - 11129	Reserved				Reserved	44
						Block Size:	58
Data and Control Block -- **Digital I/O Pulse Output Card Overlay (Note 15)**			**15)**			read-only except as indicated	
2B3F - 2B3F	11072 - 11072	Digital Input States	UINT16	bit-mapped	dddd cccc bbbb aaaa	Nibble "dddd" for input#4, "cccc" for input#3, "bbbb" for input#2 and "aaaa" for input#1. Within each field, rightmost bit is the current state (1=closed, 0=open), and bits at left are the older states 100ms apart (historical states). Example: xxxx xxxx xxxx 0011 Current state of input#1 is closed, before that it was closed too, before that it was open and the oldest state known is open.	1

2B40 - 2B40	11073 - 11073	Digital Output States	UINT16	bit-mapped	-------- ----4321	One bit for each output. Bit 4 is for output #4, and bit 1 is for output #1. If a bit is set the output is closed, otherwise it is opened.	1
2B41 - 2B41	11074 - 11074	Pulse Output Test Select	UINT16	bit-mapped	-------- ----4321	Writing 1 in bit N sets Pulse Output N+1 in test mode. Writing 0 otherwise, reestablished the output in normal operation (only while in privileged session). When Reading this reports which Pulse Output is under test according to the bits set or cleared (1=under test, 0=normal).	1
2B42 - 2B42	11075 - 11075	Pulse Output Test Power	UINT16	bit-mapped	ddvvvvvv vvvvvvvv	This register is Writeable in privileged session only. Simulates constant Power for the Pulse Output under test. Format is same as Kt settings for Pulse Output. "V" is raw value in Wh/pulse from 0 to 9999. "dd"=decimal point position: 00=0.XXXX, 01=X.XXX, 10=XX.XX, 11= X.XXX.	1
2B43 - 2B46	11076 - 11079	Reserved				Reserved	4
2B47 - 2B47	11080 - 11080	Input 1 Accumulator, Scaled	UINT16	0 to 9999	resolution is 1, 10, 100, 1000, 10000, or 100000 counts	Disabled accumulators always read 0.	1
2B48 - 2B48	11081 - 11081	Input 2 Accumulator, Scaled	UINT16	0 to 9999			1
2B49 - 2B49	11082 - 11082	Input 3 Accumulator, Scaled	UINT16	0 to 9999			1
2B4A - 2B4A	11083 - 11083	Input 4 Accumulator, Scaled	UINT16	0 to 9999			1
2B4B - 2B4B	11084 - 11084	Output 1 Accumulator, Scaled	UINT16	0 to 9999			1
2B4C - 2B4C	11085 - 11085	Output 2 Accumulator, Scaled	UINT16	0 to 9999			1
2B4D - 2B4D	11086 - 11086	Output 3 Accumulator, Scaled	UINT16	0 to 9999			1
2B4E - 2B4E	11087 - 11087	Output 4 Accumulator, Scaled	UINT16	0 to 9999			1
2B4F - 2B78	11088 - 11129	Reserved				Reserved	42
						Block Size:	58

Data and Control Block - Analog Out 0-1mA / Analog Out 4-20mA (Note 15)							read-only	
2B3F - 2B3F	11072 - 11072	Status of card	UINT16	bit-mapped	----cf-- --------	Flag fields: c=calibration not good; f=configuration error		1
2B40 - 2B78	11073 - 11129	Reserved	UINT16			Reserved		57
						Block Size:		58
Accumulators Block							read-only	
2EDF - 2EE0	12000 - 12001	Option Card 1, Input 1 Accumulator	UINT32	0 to 999999999	number of transitions	These are unscaled counts. See option card section for scaled versions. Input accumulators count either or both transitions; output accumulators count both transitions. Unused accumulators always read 0.		2
2EE1 - 2EE6	12002 - 12007	Option Card 1, Inputs 2-4 Accumulators	UINT32	0 to 999999999	number of transitions			6
2EE7 - 2EE8	12008 - 12009	Option Card 1, Output or Relay 1 Accumulator	UINT32	0 to 999999999	number of transitions			2
2EE9 - 2EEE	12010 - 12015	Option Card 1, Output or Relays 2-4 Accumulators	UINT32	0 to 999999999	number of transitions			6
2EEF - 2EF6	12016 - 12023	Option Card 2 Inputs Accumulators	UINT32	0 to 999999999	number of transitions			8
2EF7 - 2EFE	12024 - 12031	Option Card 2 Outputs Accumulators	UINT32	0 to 999999999	number of transitions			8
						Block Size:		32
		Commands Section4						
Resets Block9							write-only	
4E1F - 4E1F	20000 - 20000	Reset Max/Min Blocks	UINT16	password5				1
4E20 - 4E20	20001 - 20001	Reset Energy Accumulators	UINT16	password5				1
4E21 - 4E21	20002 - 20002	Reserved				Set to 0.		1
4E22 - 4E22	20003 - 20003	Reserved						1
4E23 - 4E23	20004 - 20004	Reserved						1
4E24 - 4E24	20005 - 20005	Reserved						1
4E25 - 4E25	20006 - 20006	Reserved						1
4E26 - 4E26	20007 - 20007	Reserved						1
		Reserved Registers						
4E27 - 4E2E	20008 - 20015	Reserved				Set to 0.		8
						Block Size:		16
Privileged Commands Block							conditional write	
5207 - 5207	21000 - 21000	Initiate Meter Firmware Reprogramming	UINT16	password5				1
5208 - 5208	21001 - 21001	Force Meter Restart	UINT16	password5		Causes a watchdog reset, always reads 0.		1

5209 - 5209	21002 - 21002	Open Privileged Command Session	UINT16	password5		Meter will process command registers (this register through 'Close Privileged Command Session' register below) for 5 minutes or until the session is closed, whichever comes first.	1
520A - 520A	21003 - 21003	Initiate Programmable Settings Update	UINT16	password5		Meter enters PS update mode.	1
520B - 520B	21004 - 21004	Calculate Programmable Settings Check-sum3	UINT16	0000 to 9999		Meter calculates checksum on RAM copy of PS block.	1
520C - 520C	21005 - 21005	Programmable Settings Checksum3	UINT16	0000 to 9999		Read/write checksum register; PS block saved in nonvolatile memory on write[8].	1
520D - 520D	21006 - 21006	Write New Password3	UINT16	0000 to 9999		Write-only register; always reads zero.	1
520E - 520E	21007 - 21007	Terminate Programmable Settings Update3	UINT16	any value		Meter leaves PS update mode via reset.	1
520F - 5211	21008 - 21010	Set Meter Clock	TSTAMP	1Jan2000 - 31Dec2099	1 sec	Saved only when 3rd register is written.	3
5212 - 5212	21011 - 21011	Reserved				Set to 0.	1
5213 - 5219	21012 - 21018	Reserved				Set to 0.	7
521A - 521A	21019 - 21019	Close Privileged Command Session	UINT16	any value		Ends an open command session.	1
						Block Size:	20
Encryption Block						read/write	
658F - 659A	26000 - 26011	Perform a Secure Operation	UINT16			Encrypted command to read password or change meter type.	12
						Block Size:	12

Programmable Settings Section

Basic Setups Block						write only in PS update mode	
752F - 752F	30000 - 30000	CT multiplier & denominator	UINT16	bit-mapped	ddddddddd mmmmm-mmm	High byte is denomina-tor (1 or 5, read-only), low byte is multiplier (1, 10, or 100).	1
7530 - 7530	30001 - 30001	CT numerator	UINT16	1 to 9999	none		1
7531 - 7531	30002 - 30002	PT numerator	UINT16	1 to 9999	none		1
7532 - 7532	30003 - 30003	PT denominator	UINT16	1 to 9999	none		1

7533 - 7533	30004 - 30004	PT multiplier & hookup	UINT16	bit-mapped	mmmmmmmm mm-mmhhhh	mm…mm = PT multiplier (1, 10, 100, or 1000) hhhh = hookup enu-meration (0 = 3 element wye[9S], 1 = delta 2 CTs[5S], 3 = 2.5 element wye[6S])	1
7534 - 7534	30005 - 30005	Averaging Method	UINT16	bit-mapped	--iiiiii b----sss	iiiiii = interval (5,15,30,60) b = 0-block or 1-rolling sss = # subintervals (1,2,3,4)	1
7535 - 7535	30006 - 30006	Power & Energy Format	UINT16	bit-mapped	pppp--nn -eee-ddd	pppp = power scale (0-unit, 3-kilo, 6-mega, 8-auto) nn = number of energy digits (5-8 --> 0-3) eee = energy scale (0-unit, 3-kilo, 6-mega) ddd = energy digits after decimal point (0-6) See note 10.	1
7536 - 7536	30007 - 30007	Operating Mode Screen Enables	UINT16	bit-mapped	-------- eeeeeeee	eeeeeeee = op mode screen rows on/off, rows top to bottom are bits low order to high order.	1

753E - 753E	30015 - 30015	User Settings Flags	UINT16	bit-mapped	---g--nn srpdywf-	g = enable alternate full scale bar graph current (1=on, 0=off) nn = number of phases for voltage & current screens (3=ABC, 2=AB, 1=A, 0=ABC) s = scroll (1=on, 0=off) r = password for reset in use (1=on, 0=off) p = password for configuration in use (1=on, 0=off) d = daylight saving time changes (0=off, 1=on) y = diagnostic events in system log (1=yes, 0=no) w = power direction (0=view as load, 1=view as generator) f = flip power factor sign (1=yes, 0=no)	1
753F - 753F	30016 - 30016	Full Scale Current (for load % bar graph)	UINT16	0 to 9999	none	If non-zero and user settings bit g is set, this value replaces CT numerator in the full scale current calculation.	1
7540 - 7547	30017 - 30024	Meter Designation	ASCII	16 char	none		8
7548 - 7548	30025 - 30025	Reserved				Set to 0.	1
7549 - 7549	30026 - 30026	COM2 setup	UINT16	bit-mapped	----dddd -ppp-bbb	dddd = reply delay (* 50 msec) ppp = protocol (1-Modbus RTU, 2-Modbus ASCII, 3-DNP) bbb = baud rate (1-9600, 2-19200, 4-38400, 6-57600)	1
754A - 754A	30027 - 30027	COM2 address	UINT16	1 to 247	none		1
754B - 754B	30028 - 30028	Limit #1 Identifier	UINT16	0 to 65535		Use Modbus address as the identifier (see notes 7, 11, 12).	1
754C - 754C	30029 - 30029	Limit #1 Out High Setpoint	SINT16	-200.0 to +200.0	0.1% of full scale	Setpoint for the "above" limit (LM1), see notes 11-12.	1
754D - 754D	30030 - 30030	Limit #1 In High Threshold	SINT16	-200.0 to +200.0	0.1% of full scale	Threshold at which "above" limit clears; normally less than or equal to the "above" setpoint; see notes 11-12.	1

754E - 754E	30031 - 30031	Limit #1 Out Low Setpoint	SINT16	-200.0 to +200.0	0.1% of full scale	Setpoint for the "below" limit (LM2), see notes 11-12.	1
754F - 754F	30032 - 30032	Limit #1 In Low Threshold	SINT16	-200.0 to +200.0	0.1% of full scale	Threshold at which "below" limit clears; normally greater than or equal to the "below" setpoint; see notes 11-12.	1
7550 - 7554	30033 - 30037	Limit #2	SINT16	Same as Limit #1.	Same as Limit #1.	Same as Limit #1.	5
7555 - 7559	30038 - 30042	Limit #3	SINT16				5
755A - 755E	30043 - 30047	Limit #4	SINT16				5
755F - 7563	30048 - 30052	Limit #5	SINT16				5
7564 - 7568	30053 - 30057	Limit #6	SINT16				5
7569 - 756D	30058 - 30062	Limit #7	SINT16				5
756E - 7572	30063 - 30067	Limit #8	SINT16				5
7573 - 7582	30068 - 30083	Reserved				Set to 0.	16
7583 - 75C2	30084 - 30147	Reserved				Set to 0.	64
75C3 - 75E5	30148 - 30182	Reserved				Set to 0.	35
75E6 - 75E6	30183 - 30183	Programmable Settings Update Counter	UINT16	0-65535		Increments each time programmable settings are changed; occurs when new checksum is calculated.	1
75E7 - 7626	30184 - 30247	Reserved for Software Use				Set to 0.	64
						Block Size:	248
Reserved Block						write only in PS update mode	
7917 - 7B56	31000 - 31575	Reserved				Set to 0.	576
Reserved Registers. Set to 0.							
7B57 - 7B76	31576 - 31607	Reserved				Set to 0.	32
						Block Size:	608
Programmable Settings for Option Card 1							
Option Card 1 Setups Block						write only in PS update mode	
7CFF - 7CFF	32000 - 32000	Class ID of the Option Card 1 Settings	UINT16	bit-mapped	-------- cccctttt	Which class (cccc) and type(tttt) of card the Option Settings for Card 1 apply to. See note 19.	1
7D00 - 7D3E	32001 - 32063	Settings for Option Card 1, First Overlay -- see below	Register assignments depend on which type of card is in the slot. See overlays below.				63
7D3F - 7F3E	32064 - 32575	Settings for Option Card 1, Second Overlay -- see below	Register assignments depend on which type of card is in the slot. See overlays below.				512
						Block Size:	576

Overlays for Option Card 1 Programmable Settings

Settings Registers for any communication capable card, including analog cards						First Overlay	write only in PS update mode	
7D00 -	7D00	32001 -	32001	Slave address	UINT16	1~247 (for Modbus) 1~65534 (for DNP)	none	Slave address of the unit. The communication capable card is always a master. Set to 0 when an analog board is installed.	1
7D01 -	7D01	32002 -	32002	Speed and format	UINT16	bit-mapped	-abcde--fghijklm	Bps: a=57600; b=38400; c=19200; d=14400; e=9600 Stop bits 'f': cleared 1 stop bit, set 2 stop bits Parity: g=even; h=odd; i=none Data bits: j=8; k=7; l=6; m=5 Set to 0 when an analog board is installed.	1
7D02 -	7D02	32003 -	32003	Reserved	UINT16	bit-mapped		Set to 0.	1
7D03 -	7D03	32004 -	32004	Protocol	UINT16	bit-mapped	-------- -----ppp-	ppp= 100 =DNP3 Lite; 010=ASCII Modbus; 001=RTU Modbus Set to 0 when an analog board is installed.	1
7D04 -	7D04	32005 -	32005	Reply delay	UINT16	0 to 65535	milliseconds	Delay to reply to a Modbus transaction after receiving it. Set to 0 when an analog board is installed.	1
7D05 -	7D3E	32006 -	32063	Reserved				Set to 0.	58
								Block Size:	63
Settings Registers for Digital I/O Relay Card						First Overlay	write only in PS update mode	
7D00 -	7D00	32001 -	32001	Input#1 - 2 bindings & logging enables	UINT16	bit-mapped	-------- 2222 1111	One nibble for each input. Assuming "abcd" as the bits in each nibble: "a": select this input for EOI (End Of Interval) pulse sensing. "b": log this input when pulse is detected "cc": Input event trigger mode - Contact sensing method; 00 = none; 01 = open to close; 10 = close to open; 11 = any change.	1

7D01 - 7D01	32002 - 32002	Relay #1 Delay to Operate	UINT16	0.1 second units		Delay to operate the relay since request.	1
7D02 - 7D02	32003 - 32003	Relay #1 Delay to Release	UINT16	0.1 second units		Delay to release the relay since request.	1
7D03 - 7D08	32004 - 32009	Reserved	UINT16			Set to 0.	6
7D09 - 7D09	32010 - 32010	Relay #2 Delay to Operate	UINT16	0.1 second units		Delay to operate the relay since request.	1
7D0A - 7D0A	32011 - 32011	Relay #2 Delay to Release	UINT16	0.1 second units		Delay to release the relay since request.	1
7D0B - 7D20	32012 - 32033	Reserved	UINT16			Set to 0.	22
7D21 - 7D21	32034 - 32034	Input Accumulators Scaling	UINT16	bit-mapped	-------- 22221111	* 4 bits per accumulator * 0xF disables the ac-cumulation * 0-5 = power of divisor for the scaled accumulator Example: count=12456, 4bits=3: divisor=103=1000 & scaled accumulator=12.	1
7D22 - 7D22	32035 - 32035	Relay Accumulators Scaling	UINT16	bit-mapped	-------- 22221111		1
7D23 - 7D3E	32036 - 32063	Reserved				Set to 0.	28
						Block Size:	63
Settings Registers for Digital I/O Pulse Output Card					First Overlay	write only in PS update mode	
7D00 - 7D00	32001 - 32001	Input#1 - 4 bindings & logging enables	UINT16	bit-mapped	44443333 22221111	One nibble for each of the 4 inputs. Assuming "-bcc" as the bits in each nibble: "b": Log this input when pulse is detected "cc": Input event trigger mode - Contact sensing method; 00 = none; 01 = open to close; 10 = close to open; 11 = any change.	1

7D01 - 7D01	32002 - 32002	Source for Pulse Ouput#1	UINT16	enumeration	-----ppp ----vvvv	"ppp" (Phase) : 000 = none, 001 = Phase A, 010 = Phase B, 011 = Phase C, 100 = All Phases, 101 = Pulse from EOI(End Of Interval). "vvvv"(Value) : 0000= none, 0001 = Wh, 0010 = +Wh, 0011 = -Wh, 0100= Varh, 0101 = +Varh, 0110 = -Varh, 0111 = VAh, 1000= Received Wh, 1001= Delivered Wh, 1010= Inductive Varh, 1011 = Capacitive Varh	1
7D02 - 7D02	32003 - 32003	Kt [Wh/pulse] factor for Pulse Output#1	UINT16	bit-mapped	ddVVVVVV VVVVVVVV	"V…V" = not scaled energy value per pulse, from 0 to 9999. "dd"= decimal point position: 00=0.XXXX, 01=X.XXX, 10=XX.XX, 11= X.XXX.	1
7D03 - 7D04	32004 - 32005	Output#2 Assignment and Kt	UINT16	Same as Output #1.			2
7D05 - 7D06	32006 - 32007	Output#3 Assignment and Kt	UINT16	Same as Output #1.			2
7D07 - 7D08	32008 - 32009	Output#4 Assignment and Kt	UINT16	Same as Output #1.			2
7D09 - 7D09	32010 - 32010	Input Accumulators Scaling	UINT16	bit-mapped	44443333 22221111	See Relay Card above.	1
7D0A - 7D0A	32011 - 32011	Output Accumulators Scaling	UINT16	bit-mapped	44443333 22221111		1
7D0B - 7D3E	32012 - 32063	Reserved				Set to 0.	52
						Block Size:	63
Settings Registers for Digital I/O Relay Card					Second Overlay	write only in PS update mode	
7D3F - 7D46	32064 - 32071	Input#1 Label	ASCII	16 char			8
7D47 - 7D4E	32072 - 32079	Input#1 Low State Name	ASCII	16 char			8
7D4F - 7D56	32080 - 32087	Input#1 High State Name	ASCII	16 char			8
7D57 - 7D6E	32088 - 32111	Input#2 Label and State Names	Same as Input #1.				24
7D6F - 7D9E	32112 - 32159	Reserved				Set to 0.	48
7D9F - 7DA6	32160 - 32167	Relay#1 Label	ASCII	16 char			8
7DA7 - 7DAE	32168 - 32175	Relay#1 Open State Name	ASCII	16 char			8
7DAF - 7DB6	32176 - 32183	Relay#1 Closed State Name	ASCII	16 char			8
7DB7 - 7DCE	32184 - 32207	Relay#2 Label and State Names	Same as Relay #1.				24

7DCF - 7DFE	32208 - 32255	Reserved				Set to 0.	48
7DFF - 7E06	32256 - 32263	Input#1 Accumulator Label	ASCII	16 char			8
7E07 - 7E0E	32264 - 32271	Input#2 Accumulator Label	ASCII	16 char			8
7E0F - 7E1E	32272 - 32287	Reserved				Set to 0.	16
7E1F - 7E1F	32288 - 32288	Input#1 Accumulator Kt	UINT16	bit-mapped	ddVVVVVV VVVVVVVV	KT power factor for the Pulse Output. "V" is raw power value in Wh/pulse from 0 to 9999. "dd"=decimal point position: 00=0.XXXX, 01=X.XXX, 10=XX.XX, 11= X.XXX.	1
7E20 - 7E20	32289 - 32289	Input#2 Accumulator Kt	UINT16	bit-mapped	ddVVVVVV VVVVVVVV		1
7E21 - 7F3E	32290 - 32575	Reserved				Set to 0.	286
						Block Size:	512

Settings Registers for Digital I/O Pulse Output Card					Second Overlay	write only in PS update mode	
7D3F - 7D46	32064 - 32071	Input#1 Label	ASCII	16 char			8
7D47 - 7D4E	32072 - 32079	Input#1 Low State Name	ASCII	16 char			8
7D4F - 7D56	32080 - 32087	Input#1 High State Name	ASCII	16 char			8
7D57 - 7D6E	32088 - 32111	Input#2 Label and State Names	Same as Input #1.				24
7D6F - 7D86	32112 - 32135	Input#3 Label and State Names	Same as Input #1.				24
7D87 - 7D9E	32136 - 32159	Input#4 Label and State Names	Same as Input #1.				24
7D9F - 7DA6	32160 - 32167	Output#1 Label	ASCII	16 char			8
7DA7 - 7DAE	32168 - 32175	Output#1 Open State Name	ASCII	16 char			8
7DAF - 7DB6	32176 - 32183	Output#1 Closed State Name	ASCII	16 char			8
7DB7 - 7DCE	32184 - 32207	Output#2 Label and State Names	Same as Output #1.				24
7DCF - 7DE6	32208 - 32231	Output#3 Label and State Names	Same as Output #1.				24
7DE7 - 7DFE	32232 - 32255	Output#4 Label and State Names	Same as Output #1.				24
7DFF - 7E06	32256 - 32263	Input#1 Accumulator Label	ASCII	16 char			8
7E07 - 7E0E	32264 - 32271	Input#2 Accumulator Label	ASCII	16 char			8
7E0F - 7E16	32272 - 32279	Input#3 Accumulator Label	ASCII	16 char			8
7E17 - 7E1E	32280 - 32287	Input#4 Accumulator Label	ASCII	16 char			8
7E1F - 7E1F	32288 - 32288	Input#1 Accumulator Kt	UINT16	bit-mapped	ddVVVVVV VVVVVVVV	KT power factor for the accumulator input. "V" is raw power value in Wh/pulse from 0 to 9999. "dd"=decimal point position: 00=0.XXXX, 01=X.XXX, 10=XX.XX, 11= X.XXX.	1
7E20 - 7E20	32289 - 32289	Input#2 Accumulator Kt	UINT16	bit-mapped	ddVVVVVV VVVVVVVV		1
7E21 - 7E21	32290 - 32290	Input#3 Accumulator Kt	UINT16	bit-mapped	ddVVVVVV VVVVVVVV		1
7E22 - 7E22	32291 - 32291	Input#4 Accumulator Kt	UINT16	bit-mapped	ddVVVVVV VVVVVVVV		1
7E23 - 7F3E	32292 - 32575	Reserved				Set to 0.	284
						Block Size:	512

Settings Registers for Analog Out 0-1mA / Analog Out 4-20mA Cards							Second Overlay	write only in PS update mode	
7D3F - 7D3F	32064 - 32064	Update rate	UINT16	0 to 65535	milliseconds	Set to 0.	1
7D40 - 7D40	32065 - 32065	Channel direction - 1mA Card only!	UINT16	bit-mapped	-------- ----4321	Full range output for 0-1mA card only: A bit set(1) means full range (-1mA to +1mA); a bit cleared(0) means source only (0mA to +1mA).	1
7D41 - 7D41	32066 - 32066	Format parameter for output #1	UINT16	bit-mapped	-------- ---f suwb	Format of the polled register:f=float 32; s=signed 32 bit int; u=unsigned 32 bit int; w=signed 16 bit int; b=unsigned 16 bit int.	1
7D42 - 7D42	32067 - 32067	Source register for Output#1	UINT16	0 to 65535		This register should be programmed with the address of the register, whose value is to be used for current output. In different words, the current level output of analog board will change with the value of the register pointed here.	1
7D43 - 7D44	32068 - 32069	High value of source register for output#1	Depends on the format parameter			Value read from the source register at which High nominal current will be output. Ex-ample: for the 4-20mA card, if this register is programmed with 750, then the current output will be 20mA when the value read from the source register is 750.	2
7D45 - 7D46	32070 - 32071	Low value of source register for output#1	Depends on the format parameter			Value read from the source register at which Low nominal current will be output. Ex-ample: for the 4-20mA card, if this register is programmed with 0, then the current output will be 4mA when the value read from the source register is 0.	2
7D47 - 7D4C	32072 - 32077	Analog output#2 format, register, max & min	Same as analog output #1.				6
7D4D - 7D52	32078 - 32083	Analog output#3 format, register, max & min	Same as analog output.#1.				6
7D53 - 7D58	32084 - 32089	Analog output#4 format, register, max & min	Same as analog output #1.				6

7D59 - 7F3E	32090 - 32575	Reserved				Set to 0.	486
						Block Size:	512
Programmable Settings for Option Card 2							
Option Card 2 Setups Block						write only in PS update mode	
80E7 - 80E7	33000 - 33000	Class ID of the Option Card 2 Settings	UINT16	bit-mapped	-------- ccccttttt	Which class (cccc) and type(tttt) of card the Option Settings for Card 2 apply to. See note 19.	1
80E8 - 8126	33001 - 33063	Settings for Option Card 2, First Overlay -- see below	Register assignments depend on which type of card is in the slot. See overlays below.				63
8127 - 8326	33064 - 33575	Settings for Option Card 2, Second Overlay -- see below	Register assignments depend on which type of card is in the slot. See overlays below.				512
						Block Size:	576
Overlays for Option Card 2 Programmable Settings							
Settings Registers for any communication capable card, including analog cards					First Overlay	write only in PS update mode	
80E8 - 80E8	33001 - 33001	Slave address	UINT16	1~247 (for Modbus) 1~65534 (for DNP)	none	Slave address of the unit. The communication capable card is always a master. Set to 0 when an analog board is installed.	1
80E9 - 80E9	33002 - 33002	Speed and format	UINT16	bit-mapped	-abcde--fghijklm	Bps: a=57600; b=38400; c=19200; d=14400; e=9600 Stop bits 'f': cleared 1 stop bit, set 2 stop bits Parity: g=even; h=odd; i=none Data bits: j=8; k=7; l=6; m=5 Set to 0 when an analog board is installed.	1
80EA - 80EA	33003 - 33003	Reserved	UINT16	bit-mapped		Set to 0.	1
80EB - 80EB	33004 - 33004	Protocol	UINT16	bit-mapped	-------- -----ppp-	ppp= 100 =DNP3 Lite; 010=Ascii Modbus; 001=Rtu Modbus Set to 0 when an analog board is installed.	1
80EC - 80EC	33005 - 33005	Reply delay	UINT16	0 to 65535	milliseconds	Delay to reply to a Modbus transaction after receiving it. Set to 0 when an analog board is installed	1
80ED - 8126	33006 - 33063	Reserved				Set to 0.	58
						Block Size:	63

Settings Registers for Digital I/O Relay Card						First Overlay	write only in PS update mode	
80E8 - 80E8	33001 - 33001	Input#1 - 2 bindings & logging enables	UINT16	bit-mapped	-------- 2222 1111	One nibble for each input. Assuming "abcd" as the bits in each nibble: "a": select this input for EOI (End Of Interval) pulse sensing. "b": log this input when pulse is detected "cc": Input event trigger mode - Contact sensing method; 00 = none; 01 = open to close; 10 = close to open; 11 = any change.		1
80E9 - 80E9	33002 - 33002	Relay #1 Delay to Operate	UINT16	0.1 second units		Delay to operate the relay since request.		1
80EA - 80EA	33003 - 33003	Relay #1 Delay to Release	UINT16	0.1 second units		Delay to release the relay since request.		1
80EB - 80F0	33004 - 33009	Reserved	UINT16			Set to 0.		6
80F1 - 80F1	33010 - 33010	Relay #2 Delay to Operate	UINT16	0.1 second units		Delay to operate the relay since request.		1
80F2 - 80F2	33011 - 33011	Relay #2 Delay to Release	UINT16	0.1 second units		Delay to release the relay since request.		1
80F3 - 8108	33012 - 33033	Reserved	UINT16			Set to 0.		22
8109 - 8109	33034 - 33034	Input Accumulators Scaling	UINT16	bit-mapped	-------- 22221111	* 4 bits per accumulator * 0xF disables the ac-cumulation * 0-5 = power of divisor for the scaled accumulator Example: count=12456, 4bits=3: divisor=103=1000 & scaled accumulator=12.		1
810A - 810A	33035 - 33035	Relay Accumulators Scaling	UINT16	bit-mapped	-------- 22221111			1
810B - 8126	33036 - 33063	Reserved				Set to 0.		28
						Block Size:		63
Settings Registers for Digital I/O Pulse Output Card						First Overlay	write only in PS update mode	
80E8 - 80E8	33001 - 33001	Input#1 - 4 bindings & logging enables	UINT16	bit-mapped	44443333 22221111	One nibble for each of the 4 inputs. Assuming "-bcc" as the bits in each nibble: "b": Log this input when pulse is detected "cc": Input event trigger mode - Contact sensing method; 00 = none; 01 = open to close; 10 = close to open; 11 = any change.		1

80E9 - 80E9	33002 - 33002	Source for Pulse Ouput#1	UINT16	enumeration	-----ppp ----vvvv	"ppp" (Phase) : 000 = none, 001 = Phase A, 010 = Phase B, 011 = Phase C, 100 = All Phases, 101 = Pulse from EOI(End Of Interval). "vvvv"(Value) : 0000= none, 0001 = Wh, 0010 = +Wh, 0011 = -Wh, 0100= Varh, 0101 = +Varh, 0110 = -Varh, 0111 = VAh, 1000= Received Wh, 1001= Delivered Wh, 1010= Inductive Varh, 1011 = Capacitive Varh	1
80EA - 80EA	33003 - 33003	Kt [Wh/pulse] factor for Pulse Output#1	UINT16	bit-mapped	ddVVVVVV VVVVVVVV	"V…V" = not scaled energy value per pulse, from 0 to 9999. "dd"= decimal point position: 00=0.XXXX, 01=X.XXX, 10=XX.XX, 11= X.XXX.	1
80EB - 80EC	33004 - 33005	Output#2 Assignment and Kt	UINT16	Same as Output #1.			2
80ED - 80EE	33006 - 33007	Output#3 Assignment and Kt	UINT16	Same as Output #1.			2
80EF - 80F0	33008 - 33009	Output#4 Assignment and Kt	UINT16	Same as Output #1.			2
80F1 - 80F1	33010 - 33010	Input Accumulators Scaling	UINT16	bit-mapped	44443333 22221111	See Relay Card above.	1
80F2 - 80F2	33011 - 33011	Output Accumulators Scaling	UINT16	bit-mapped	44443333 22221111		1
80F3 - 8126	33012 - 33063	Reserved				Set to 0.	52
						Block Size:	63

Settings Registers for Analog Out 0-1mA / Analog Out 4-20mA Cards					Second Overlay	write only in PS update mode	
8127 - 8127	33064 - 33064	Update rate	UINT16	0 to 65535	milliseconds	Set to 0.	1
8128 - 8128	33065 - 33065	Channel direction - 1mA Card only!	UINT16	bit-mapped	-------- ----4321	Full range output for 0-1mA card only: A bit set(1) means full range (-1mA to +1mA); a bit cleared(0) means source only (0mA to +1mA).	1
8129 - 8129	33066 - 33066	Format parameter for output #1	UINT16	bit-mapped	-------- ---f suwb	Format of the polled register:f=float 32; s=signed 32 bit int; u=unsigned 32 bit int; w=signed 16 bit int; b=unsigned 16 bit int.	1

812A - 812A	33067 - 33067	Source register for Output#1	UINT16	0 to 65535		This register should be programmed with the address of the register, whose value is to be used for current output. In different words, the current level output of analog board will change with the value of the register pointed here.	1
812B - 812C	33068 - 33069	High value of source register for output#1	Depends on the format parameter			Value read from the source register at which High nominal current will be output. Example: for the 4-20mA card, if this register is programmed with 750, then the current output will be 20mA when the value read from the source register is 750.	2
812D - 812E	33070 - 33071	Low value of source register for output#1	Depends on the format parameter			Value read from the source register at which Low nominal current will be output. Example: for the 4-20mA card, if this register is programmed with 0, then the current output will be 4mA when the value read from the source register is 0.	2
812F - 8134	33072 - 33077	Analog output#2 format, register, max & min	Same as analog output #1.				6
8135 - 813A	33078 - 33083	Analog output#3 format, register, max & min	Same as analog output #1.				6
813B - 8140	33084 - 33089	Analog output#4 format, register, max & min	Same as analog output #1.				6
8141 - 8326	33090 - 33575	Reserved				Set to 0.	486
						Block Size:	512

12-Bit Readings Section

12-Bit Block						read-only except as noted	
9C40 - 9C40	40001 - 40001	System Sanity Indicator	UINT16	0 or 1	none	0 indicates proper meter operation.	1
9C41 - 9C41	40002 - 40002	Volts A-N	UINT16	2047 to 4095	volts	2047= 0, 4095= +150 volts = 150 * (register - 2047) / 2047	1
9C42 - 9C42	40003 - 40003	Volts B-N	UINT16	2047 to 4095	volts		1
9C43 - 9C43	40004 - 40004	Volts C-N	UINT16	2047 to 4095	volts		1
9C44 - 9C44	40005 - 40005	Amps A	UINT16	0 to 4095	amps	0= -10, 2047= 0, 4095= +10	1

9C45 - 9C45	40006 - 40006	Amps B	UINT16	0 to 4095	amps	amps = 10 * (register - 2047) / 2047	1
9C46 - 9C46	40007 - 40007	Amps C	UINT16	0 to 4095	amps		1
9C47 - 9C47	40008 - 40008	Watts, 3-Ph total	UINT16	0 to 4095	watts	0= -3000, 2047= 0, 4095= +3000	1
9C48 - 9C48	40009 - 40009	VARs, 3-Ph total	UINT16	0 to 4095	VARs	watts, VARs, VAs =	1
9C49 - 9C49	40010 - 40010	VAs, 3-Ph total	UINT16	2047 to 4095	VAs	3000 * (register - 2047) / 2047	1
9C4A - 9C4A	40011 - 40011	Power Factor, 3-Ph total	UINT16	1047 to 3047	none	1047= -1, 2047= 0, 3047= +1 pf = (register - 2047) / 1000	1
9C4B - 9C4B	40012 - 40012	Frequency	UINT16	0 to 2730	Hz	0= 45 or less, 2047= 60, 2730= 65 or more freq = 45 + ((register / 4095) * 30)	1
9C4C - 9C4C	40013 - 40013	Volts A-B	UINT16	2047 to 4095	volts	2047= 0, 4095= +300	1
9C4D - 9C4D	40014 - 40014	Volts B-C	UINT16	2047 to 4095	volts	volts = 300 * (register - 2047) / 2047	1
9C4E - 9C4E	40015 - 40015	Volts C-A	UINT16	2047 to 4095	volts		1
9C4F - 9C4F	40016 - 40016	CT numerator	UINT16	1 to 9999	none	CT = numerator * multi-plier / denominator	1
9C50 - 9C50	40017 - 40017	CT multiplier	UINT16	1, 10, 100	none		1
9C51 - 9C51	40018 - 40018	CT denominator	UINT16	1 or 5	none		1
9C52 - 9C52	40019 - 40019	PT numerator	UINT16	1 to 9999	none	PT = numerator * multi-plier / denominator	1
9C53 - 9C53	40020 - 40020	PT multiplier	UINT16	1, 10, 100	none		1
9C54 - 9C54	40021 - 40021	PT denominator	UINT16	1 to 9999	none		1
9C55 - 9C56	40022 - 40023	W-hours, Positive	UINT32	0 to 99999999	Wh per energy format	* 5 to 8 digits	2
9C57 - 9C58	40024 - 40025	W-hours, Negative	UINT32	0 to 99999999	Wh per energy format	* decimal point implied, per energy format	2
9C59 - 9C5A	40026 - 40027	VAR-hours, Positive	UINT32	0 to 99999999	VARh per energy format	* resolution of digit before decimal point = units, kilo, or mega, per energy format	2
9C5B - 9C5C	40028 - 40029	VAR-hours, Negative	UINT32	0 to 99999999	VARh per energy format		2
9C5D - 9C5E	40030 - 40031	VA-hours	UINT32	0 to 99999999	VAh per energy format	* see note 10	2
9C5F - 9C60	40032 - 40033	W-hours, Positive, Phase A	UINT32	0 to 99999999	Wh per energy format		2
9C61 - 9C62	40034 - 40035	W-hours, Positive, Phase B	UINT32	0 to 99999999	Wh per energy format		2
9C63 - 9C64	40036 - 40037	W-hours, Positive, Phase C	UINT32	0 to 99999999	Wh per energy format		2
9C65 - 9C66	40038 - 40039	W-hours, Negative, Phase A	UINT32	0 to 99999999	Wh per energy format		2
9C67 - 9C68	40040 - 40041	W-hours, Negative, Phase B	UINT32	0 to 99999999	Wh per energy format		2
9C69 - 9C6A	40042 - 40043	W-hours, Negative, Phase C	UINT32	0 to 99999999	Wh per energy format		2
9C6B - 9C6C	40044 - 40045	VAR-hours, Positive, Phase A	UINT32	0 to 99999999	VARh per energy format		2
9C6D - 9C6E	40046 - 40047	VAR-hours, Positive, Phase B	UINT32	0 to 99999999	VARh per energy format		2
9C6F - 9C70	40048 - 40049	VAR-hours, Positive, Phase C	UINT32	0 to 99999999	VARh per energy format		2
9C71 - 9C72	40050 - 40051	VAR-hours, Negative, Phase A	UINT32	0 to 99999999	VARh per energy format		2
9C73 - 9C74	40052 - 40053	VAR-hours, Negative, Phase B	UINT32	0 to 99999999	VARh per energy format		2
9C75 - 9C76	40054 - 40055	VAR-hours, Negative, Phase C	UINT32	0 to 99999999	VARh per energy format		2
9C77 - 9C78	40056 - 40057	VA-hours, Phase A	UINT32	0 to 99999999	VAh per energy format		2

9C79 - 9C7A	40058 - 40059	VA-hours, Phase B	UINT32	0 to 99999999	VAh per energy format			2
9C7B - 9C7C	40060 - 40061	VA-hours, Phase C	UINT32	0 to 99999999	VAh per energy format			2
9C7D - 9C7D	40062 - 40062	Watts, Phase A	UINT16	0 to 4095	watts			1
9C7E - 9C7E	40063 - 40063	Watts, Phase B	UINT16	0 to 4095	watts			1
9C7F - 9C7F	40064 - 40064	Watts, Phase C	UINT16	0 to 4095	watts			1
9C80 - 9C80	40065 - 40065	VARs, Phase A	UINT16	0 to 4095	VARs	0= -3000, 2047= 0, 4095= +3000 watts, VARs, VAs = 3000 * (register - 2047) / 2047		1
9C81 - 9C81	40066 - 40066	VARs, Phase B	UINT16	0 to 4095	VARs			1
9C82 - 9C82	40067 - 40067	VARs, Phase C	UINT16	0 to 4095	VARs			1
9C83 - 9C83	40068 - 40068	VAs, Phase A	UINT16	2047 to 4095	VAs			1
9C84 - 9C84	40069 - 40069	VAs, Phase B	UINT16	2047 to 4095	VAs			1
9C85 - 9C85	40070 - 40070	VAs, Phase C	UINT16	2047 to 4095	VAs			1
9C86 - 9C86	40071 - 40071	Power Factor, Phase A	UINT16	1047 to 3047	none	1047= -1, 2047= 0, 3047= +1 pf = (register - 2047) / 1000		1
9C87 - 9C87	40072 - 40072	Power Factor, Phase B	UINT16	1047 to 3047	none			1
9C88 - 9C88	40073 - 40073	Power Factor, Phase C	UINT16	1047 to 3047	none			1
9C89 - 9CA2	40074 - 40099	Reserved	N/A	N/A	none			26
9CA3 - 9CA3	40100 - 40100	Reset Energy Accumulators	UINT16	password5		Write-only register; always reads as 0.		1
						Block Size:		100
		Reserved Section						
Reserved Block								
C34C - C3CD	49997 - 50126	Reserved				Set to 0.		130
						Block Size:		130
Reserved Block								
C737 - C7B6	51000 - 51127	Reserved				Set to 0.		128
						Block Size:		128
		End of Map						

Data Formats	
ASCII	ASCII characters packed 2 per register in high, low order and without any termination characters. .
SINT16 / UINT16	16-bit signed / unsigned integer.
SINT32 / UINT32	32-bit signed / unsigned integer spanning 2 registers. The lower-addressed register is the high order half.
FLOAT	32-bit IEEE floating point number spanning 2 registers. The lower-addressed register is the high order half (i.e., contains the exponent).
TSTAMP	3 adjacent registers, 2 bytes each. First (lowest-addressed) register high byte is year (0-99), low byte is month (1-12). Middle register high byte is day(1-31), low byte is hour (0-23 plus DST bit). DST (daylight saving time) bit is bit 6 (0x40). Third register high byte is minutes (0-59), low byte is seconds (0-59). For example, 9:35:07AM on October 12, 2049 would be 0x310A, 0x0C49, 0x2307, assuming DST is in effect.

Notes	
1	All registers not explicitly listed in the table read as 0. Writes to these registers will be accepted but won't actually change the register (since it doesn't exist).
2	Meter Data Section items read as 0 until first readings are available or if the meter is not in operating mode. Writes to these registers will be accepted but won't actually change the register.
3	Register valid only in programmable settings update mode. In other modes these registers read as 0 and return an illegal data address exception if a write is attempted.
4	Meter command registers always read as 0. They may be written only when the meter is in a suitable mode. The registers return an illegal data address exception if a write is attempted in an incorrect mode.
5	If the password is incorrect, a valid response is returned but the command is not executed. Use 5555 for the password if passwords are disabled in the programmable settings.
6	M denotes a 1,000,000 multiplier.
7	Each identifier is a Modbus register. For entities that occupy multiple registers (FLOAT, SINT32, etc.) all registers making up the entity must be listed, in ascending order. For example, to log phase A volts, VAs, voltage THD, and VA hours, the register list would be 0x3E7, 0x3E8, 0x411, 0x412, 0x176F, 0x61D, 0x61E and the number of registers (0x7917 high byte) would be 7.
8	Writing this register causes data to be saved permanently in nonvolatile memory. Reply to the command indicates that it was accepted but not whether or not the save was successful. This can only be determined after the meter has restarted.
9	Reset commands make no sense if the meter state is LIMP. An illegal function exception will be returned.
10	Energy registers should be reset after a format change.
11	Entities to be monitored against limits are identified by Modbus address. Entities occupying multiple Modbus registers, such as floating point values, are identified by the lower register address. If any of the 8 limits is unused, set its identifier to zero. If the indicated Modbus register is not used or is a nonsensical entity for limits, it will behave as an unused limit.
12	There are 2 setpoints per limit, one above and one below the expected range of values. LM1 is the "too high" limit, LM2 is "too low". The entity goes "out of limit" on LM1 when its value is greater than the setpoint. It remains "out of limit" until the value drops below the in threshold. LM2 works similarly, in the opposite direction. If limits in only one direction are of interest, set the in threshold on the "wrong" side of the setpoint. Limits are specified as % of full scale, where full scale is automatically set appropriately for the entity being monitored:

current	FS = CT numerator * CT multiplier
voltage	FS = PT numerator * PT multiplier
3 phase power	FS = CT numerator * CT multiplier * PT numerator * PT multiplier * 3 [* SQRT(3) for delta hookup]
single phase power	FS = CT numerator * CT multiplier * PT numerator * PT multiplier [* SQRT(3) for delta hookup]
frequency	FS = 60 (or 50)
power factor	FS = 1.0
percentage	FS = 100.0
angle	FS = 180.0

13	THD not available shows 10000 in all THD and harmonic magnitude and phase registers for the channel. THD may be unavailable due to low V or I amplitude, delta hookup (V only), or Model.
14	Option Card Identification and Configuration Block is an image of the EEPROM on the card.
15	A block of data and control registers is allocated for each option slot. Interpretation of the register data depends on what card is in the slot.
16	Measurement states: Off occurs during programmable settings updates; Run is the normal measuring state; Limp indicates that an essentail non-volatile memory block is corrupted; and Warmup occurs briefly (approximately 4 seconds) at startup while the readings stabilize. Run state is required for measurement, historical logging, demand interval processing, limit alarm evaluation, min/max comparisons, and THD calculations. Resetting min/max or energy is allowed only in run and off states; warmup will return a busy exception. In limp state, the meter reboots at 5 minute intervals in an effort to clear the problem.
17	Limits evaluation for all entites except demand averages commences immediately after the warmup period. Evaluation for demand averages, maximum demands, and minimum demands commences at the end of the first demand interval after startup.
18	Only 1 input on all digital input cards may be specified as the end-of-interval pulse.
19	Combination of class and type currently defined are: 0x41 = Relay card 0x42 = Pulse card 0x81 = 0-1mA analog output card 0x82 = 4-20mA analog output card.